

Reconstruction of Delphi

D'Espouy *Fragments Antiques*

THE IDEA OF SPACE IN GREEK ARCHITECTURE

WITH SPECIAL REFERENCE TO THE DORIC TEMPLE AND ITS SETTING

BY

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FOREWORD

It is difficult, in the course of a brief introduction, to convey adequately the contribution Rex Distin Martienssen made to architecture in South Africa between the years 1935 and 1942 This book reflects only one of his activities - research into classical antiquity Those interested in other facets of his career will find a comprehensive review of his life and work in the *South African Architectural Record* of November 1942

Dr Martienssen was a man of varied accomplishments teacher, art critic, editor, practical architect, and researcher, he fulfilled these roles with equal distinction To an extremely sensitive spirit was coupled a literary facility, which enabled him to communicate his thoughts vividly to a wider field than his immediate circle Born in the Cape Province in 1905, he received his basic education at the King Edward VII School, Johannesburg, and qualified as an architect at the University of the Witwatersrand in 1929 He was then twenty-four years of age In 1932 he joined the staff of the School of Architecture at his old University A thesis on 'Constructivism' in 1940 earned him the Degree of Master of Architecture, and another The Idea of Space in Greek Architecture', the Degree of Doctor of Literature shortly afterwards In 1942 Dr Martienssen accepted a Commission in the Air Force Sub-Unit of the Rand University Training Corps He died in August of the same year, while on a course of military training at Voortrekkerhoogte He was then only 37

From many points of view this work submitted for his Doctorate represents a culminating point in his career It is the outcome of a deep interest in Hellas, which involved him in many years of serious study, as well as travel to the historic sites of ancient Crete, Greece, Italy, and Sicily Here many separate skills fall into focus to give the work its particular character

There is his appreciation of the historical background of the ancient world, his command of the field of classical archaeology, and his deep understanding of the Art of Architecture All these blend to produce a work in which scholarship is overlaid by the warmth of an architect's response to the aesthetic content of the buildings and groups of buildings he has chosen to survey for us

Dr Martienssen's individual approach to historical buildings has left a permanent mark on the teaching of the History of Architecture in the Faculty at the University of the Witwatersrand Purely historical facts formed one component of his approach, a critical appreciation of the architectural values involved formed another He believed that both of these must be explored and understood, for they represent man's accumulated experience in the sphere of building, and form the foundation of every architect's equipment.

Perhaps it was the nature of Dr Martienssen's background which made him see things vividly the way he did, which led him to emphasize visual and aesthetic values South Africa, which was his home environment, has stimulating landscapes, flora, and fauna, but there are relatively few towns and buildings with a sense of history which are at all comparable with the richness of those that abound in Europe What we have are modest in conception and scale The impact of the visual richness of Europe on a rapidly maturing and sensitive mind, on a clean slate so to speak, enabled him to view historic sites with a freshness local people might find difficult to emulate

For architects, Dr Martienssen's work will be perennially valuable, since it deals with the essential stuff from which architecture is made For the classical scholar it will serve to remind him that while men build to solve practical needs, in times of high civility they also build to enrich their lives

In conclusion, it must be noted that the publication of Dr Martienssen's thesis has been made possible by the generous financial assistance the Institute of South African Architects has given to the Witwatersrand University Press. In this way the profession has acknowledged its debt to one of its late distinguished members.

JOHN FASSLER
Dean of the Faculty of Architecture, University of the Witwatersrand

29 *January* 1953

PREFACE

The period of systematic investigation and of the theoretical reconstitution of architectural remains in Greece has by now occupied close on one hundred years The rich yield which the Greek genius for plastic art has made accessible to succeeding cycles of creative art and aesthetic judgement is recorded in the proceedings of numerous societies, in the historical surveys of archaeologists, architects, and historians, and in the museums and partial reconstructions in Greece itself French, German, American, and British schools of archaeology have been established at Athens, and the most painstaking research has been undertaken in the endeavour to co-ordinate and interpret the material finds of Greek civilization

The responsibility of the field archaeologist has, by tacit agreement, been restricted to facts and to the closest possible approximation to literal discoveries Such a framework precludes, and indeed renders undesirable, currently formed judgements on aesthetic questions with the attendant danger of completing partly formed theories by a biased reading of evidence The process of factual investigation demands the entire elimination of speculation save where it is specifically defined, it also implies the progressive extension of a framework of research that is capable of providing a stable basis on which to evaluate further discoveries

Unfortunately it seems that, in spite of the sincerity of Greek studies in the past, the aspect which has not received attention commensurate with the other and numerous branches of classical research is the aesthetic evaluation of the work which has otherwise been so magnificently expounded It is quite possible that such evaluation should only be undertaken at a point when the preliminary and categorizing portion of research has been established and clarified beyond doubt, but the risk of

indefinitely postponing a critical estimate is that the broader issues are left in a state of suspension This would mean an inevitable loss to the allied studies of Greek life, and eventually complete divorce between archaeology and social history

Professor Rhys Carpenter, in *The Humanistic Value of Archaeology*, has urged that the completing and evaluating aspect of archaeological scholarship become a more vital component in establishing the significance of architectural discoveries The link between past and present concerns us even more closely than the comments on past habit or constitution which we are accustomed to expect from the classical scholar In stating the case for a broader humanity in archaeological studies Professor Carpenter pleads for a synoptic approach to the problems of reconstruction, and attributes the following function to a new school of thought

"The new school treats nothing as isolated or isolable but seeks to fit every fragment into place, hoping to piece together a gigantic unity wherein as it were a single human eye and hand and brain strives and learns and advances through a thousand years of effort and creation Its aim is not to accumulate, but to understand "

Here we have a clue, which should serve to focus the responsibilities of the archaeologist and direct his researches toward an interpretation capable of emergence from the findings of 'an unimportant minor science'

Briefly the present thesis is an investigation of the spatial factors evidenced in the construction and siting of Greek buildings, and in the planning and organization of Greek cities The nature of the investigation has necessitated the contemplation of many buildings, which even in their ruined state are still capable of expressing their original purpose The actual starting point of the inquiry into the complex issues of Greek spatial arrangements dates (as far as one can date the beginning of a growing interest) from a visit to the remains at Delphi in 1933 The beauty of the surroundings and the brilliant treatment of the site combined to bring into focus all the issues that the central idea of 'Greek Architecture' had previously conjured up Not all visits to Greek sites are accompanied by revelations, but the lessons of Athens and Olympia, of Mycenae and Epidaurus, seemed to crystallize in the experience at Delphi; and it is from

this centre of the ancient world that my desire to set down an exposition of Greek architecture sprang

The first move in this direction was the reading of a paper to the Architectural Society in Johannesburg in 1935, when a very brief thesis on spatial experience in the temenos at Delphi was offered The substance of this analysis is by implication contained in the present thesis, but a further five years of study of the problem has enabled me to augment the material and attempt much greater precision in definition and finding

The thesis is presented in six sections, the first of which is given to a consideration of the basic elements of classical architecture, and to the nature of the structural-space relationship which such elements are capable of inducing The second section provides a broad survey of the types of building normally contributing to a Greek city, and here also are discussed many of the factors that have a background significance in an investigation of this nature The third section deals in some detail with the Greek house, an element whose unified participation in the general city scheme has perhaps not been sufficiently stressed in the past

Section IV introduces the important theme of the Doric temple, and in the seven sub-sections which are given to this building type an attempt is made to establish the manifold characteristics of the temple and their implications In the fifth section the elements of the temple group are defined and described, and, following a descriptive and historical survey of six temple sanctuaries (covering a wide range of situation and conformation) these sanctuaries are subjected to an analysis in which the moving or participating spectator provides the key to a study of the formal and spatial relationships subsisting in their arrangements

The concluding section offers the enunciation of a general theory of related volumes, a statement on the 'absolute' factor in Greek volume arrangement, and an estimate of the Greek mode in space construction

Portions of Sections II and III have appeared in the *South African Architectural Record* in papers entitled *Greek Cities* and *The Hellenistic House*, both by the present writer

R D M

University of the Witwatersrand, Johannesburg, 1941

I

THE SUBSTANCE OF ARCHITECTURE

I SPACE AND STRUCTURE

Architecture in its broadest aspects is concerned with providing shelter and a formal setting for the activities of sensate man Nevertheless the single idea of shelter which can be readily identified with building does not necessarily imply the conscious and ordered modes of construction and arrangement which are the basic constituents of architecture The earliest attempts at protection from the elements to satisfy the demands of a relatively settled existence involved only a minute modification of natural surroundings Exploitation of naturally advantageous conditions of topography such as the rude preparation of caves to provide some form of habitation at an early stage of stable and organized life does not yet introduce the idea of building, nor, even when large units of building material in a comparatively unshaped state were grouped to form a permanent dwelling, was the idea of architecture yet truly envisaged But the deliberate selection of position for construction which is reflected in the move away from the pure adaptation of existing physical conditions marks a considerable step towards arranged and controlled space, and therefore towards formal building

The technique of spatial definition on a scale commensurate with human needs imposes two conditions that have to be satisfied within the single framework that we term architecture The first is the satisfaction of the claims of order and system, of a recognizable and measurable arrangement that will demarcate the activities of man from the existing surroundings in which he plans to lead his life The second condition is the formulation of a structural vocabulary that will enable him to give practical expression to such space concepts as he postulates for the creation of shaped surroundings The earliest manifestations of

such a vocabulary in a durable medium such as stone took the form of crude arrangements in which the material intractability of the building medium resulted in an extremely high ratio of volume of material employed to volume of enclosed space For the use of units of material that were altogether too large in relation to their purpose naturally brought about an over-emphasis on structure and limited the flexibility of plan shapes and plan combinations that could be formulated without reference to actual construction

The elements of enclosure – walls and openings for doors and windows, roofs and floors – accordingly underwent an empirical development where constant endeavour to effect a feasible *rapprochement* between space and structure was the occupation of the builder The shaping of building units and the tendency to standardization of size and pattern in those units, opened up new vistas in the path towards formalism in building, while the parallel evolution of a systematic constructional idiom enabled the builder to follow out a consciously pre-determined plan of action to which material and constructive methods were made to conform This process of conceiving a structural arrangement as something complete in the mind's eye, or expressed more formally, as a projected undertaking whose full terms are stated without reference to 'practical' effort, but which is capable of conversion into the medium of material actuality, contains the germs, not only of architecture, but of what is generically known as 'classical' architecture

Construction that is undertaken without method and without fore-knowledge can be shown through the lack of centrality of idea, and through lack of deliberate control, to induce in general a state of amorphousness or incompleteness in the appearance of the resulting synthesis Such a result cannot be termed an 'arrangement', nor can we refer to it as a 'complete work' where the term complete implies more than the mere cessation of applied effort The notion of architecture, then, implies a pre-determined end, a conceptual origin, of which the material expression is only the completing process The fulfilment of stated concepts must, as we have seen, depend ultimately on the practical technique and the mastery of material that are available for the completing process

Let us consider the constituent elements of the masonry

system that was the initial structural basis of architecture These elements were the terrace, the wall, the column, and lintel.

2 PAVEMENT OR TERRACE

The creation of a level plane of reference in a practical context has a wider significance than that of its purely 'useful' aspect in an architectural arrangement

A horizontal plane, or a series of related horizontal planes, is the first essential in any system of formal arrangement intended to embrace the activities of organized or collective life The sensory equipment of man is such as to demand the visual stability which level surfaces only are capable of offering, and even in the least complex definition of usable space – that is, usable by man as a moving as well as perceiving entity – the generator of the system is a plane surface which by deliberate structural means negates the irregularity of existing topographical conditions

Even in primitive dwellings it is not unusual to find a forecourt to the entrance door of which the ground has been levelled and beaten to form a hard platform Not only does such an area provide a convenient space for everyday domestic activities such as threshing and cooking, but it satisfies the intuitive demand for repose and order and for a measurable setting [1] A more permanent treatment for such level surfaces, whether within the enclosing walls of a building, or outside the walls, was, in antiquity provided by the laying of large slabs of stone which satisfied the requirements both of geometric accuracy and of durability [2]

Such a terrace occurs in Minoan Crete in the form of the great 'Theatral Place' at Phaestos which lies to the west of the main entrance to the palace This is bounded to the north by a flight of steps (a possible prototype of the Greek theatre arrangement of historic times) and to the east by the palace walls The

[1] The Bantu hut, for example, though closely adapted to and derived from, immediate and simple needs, offers in many instances a striking demonstration of this instinctive desire to stabilize the framework of the dwelling and its setting For illustrations of characteristic examples see A M DUGGAN-CRONIN *The Bantu Tribes of South Africa* Cambridge Deighton, Bell (1928 41)

[2] Again, in the field of simple domestic architecture we may see an extension of the neolithic terrace of hard earth, in the paved space against the front wall which is characteristic of the small farmhouses of Tuscany For examples see GUY LOWELL *Smaller Italian Villas and Farmhouses*

south side is open, and it is from this direction that the palace is approached Additional significance is given to this generous terrace by a slightly raised pathway that cuts diagonally across the 'Place' from the south-east corner to a point on the theatral steps some distance from the main entrance to the building, and this suggests a ceremonial purpose for the whole arrangement which probably provided a setting for displays and functions outside the palace

In historic times, as we shall see later, the paved terrace was an integral part of the Doric temple setting, and, indeed, contributed largely to the plastic unity of the separate but related elements that constituted the temenos or enclosure

In the above brief statements the terrace has been stressed as an external or extending element in the conscious arrangement of structural forms for spatial definition The demand for horizontal surfaces naturally includes their provision as basic elements in roofed structures, and what holds good in a general sense for external conditions applies internally also

If we turn to Egypt, and particularly to a pyramid group such as that at Abusir, we can observe the geometrizing instinct applied to a large-scale demonstration with a result that shows a supreme adherence to abstract tenets and a complete disregard for the fortuitous The bold causeway that shows in Borchardt's drawing is in a sense a special case of the terrace whose function we have been examining At Abusir the causeway shares the common qualities of plane surface, of extension to the building which it defines, of transcending the surface irregularities of its setting, with the broad constructed terrace in its more usual form What distinguishes it from the terrace is its very great length and relative narrowness which impart a directional significance to its form The comparison (on a basis of visual experience related to movement) between the Abusir arrangement and a mature Greek temenos group such as that at Sunium is fruitful in the extremely wide range of *geometrical* experience which can be shown to be available in the two systems – Egyptian and Greek – n spite of the fact that, basically, they share a number of common terms

At Abusir we have from a spectator's point of view (*a*) an entrance, (*b*) a transitional or intervening space, and (*c*) a climax in the form of a temple-pyramid complex Movement as

a constituent is especially emphasized in the very beautiful causeway which links the propylaeum (*a*) with the pyramid group (*c*). The defined starting point which the propylaeum provides, and the deliberate length of the gradually sloping causeway lend an additional 'dimension' to the main structure which would be lacking if it were merely set directly in natural surroundings. Study of the drawing will show the great strength of this formal approach as a complementary element. Cognizance of the main structure from a defined point at a distance (the propylaeum) and subsequently from an infinite number of points along a pre-determined pathway so constructed as to maintain a geometric unity with the main structure, establishes for the structure a formal setting whose limits thus extend far beyond the actual confines of its own shape. As far as the spectator is concerned, the distant and progressive experience which such a framework offers greatly exceeds that which can be obtained by a blunt impact with the perceived structure, or even by a series of distant views that are accidental in sequence and liable to interruption by conditions outside the visual control of a constructed setting.

The temple group at Sunium (which we shall examine in greater detail at a more appropriate point) similarly has a propylaeum, a defined approach, and a principal structure which affords a climax in the whole arrangement. But in this Greek example the group is more self-contained – the terrace on to which the spectator emerges from the propylaeum lies generously before the temple, and is itself enclosed or at least defined by walls and flights of steps. Here is an example of the general stabilizing function of the paved terrace, one is conscious of surface, breadth, and area, of a zone which is static in implication rather than directional. Considered as an element in a progression, this forecourt corresponds to the causeway at Abusir; they differ considerably in dimension, proportion, and effect, but fundamentally they illustrate for us the wide limits of the phenomenon of architectural extension.

3 THE WALL

The wall, in general terms, is the counterpart of the terrace or pavement, and an architectonic system can be postulated whose

constituents are restricted to these two elements alone. In its simplest form (that is, without the added function of supporting a roof) the wall may be regarded as a screen, and consequently in conjunction with a paved surface it is capable of providing definition Its vertical characteristic not only suggests *measure* but also implies enclosure, although by enclosure it is not intended to convey the idea of a continuously walled area Complete definition, for example, of a rectangular area by four adjacent walls is only a special case of the general function of the wall, although such a system usually springs to the mind when the term 'enclosure' is mentioned We have seen that a formally constructed horizontal surface of finite dimensions provides the material basis for an architectural arrangement, but as yet such an element, though complete in a practical sense, still lacks the component which is visually necessary for any form of space construction This component is provided by the wall, which by virtue of its opacity obscures the extension of views beyond the area it defines, and thus 'reflects' the perception of the spectator (as we may conveniently term the participant in any space arrangement) and holds it within the arrangement

The geometrical implications of the wall add a further term to the available experience The abstract quality of a rectilinear surface of walling with the rigid horizontality and consequent parallelism of its upper edge to the basic plane of reference prevents the intrusion of the normally visible and accidental surfaces of natural surroundings within the range of vision This type of restriction – that is, by opposing constructed planes with an assessable index of geometrical finiteness and regularity against the apparent irregularity of existing topographical conditions – offers a key to the general problem of adjusted surroundings, and further, directly evidences the fundamental and predominant geometrizing tendency of thinking man, the tendency to envelope his activities in a framework of visual stability, of known and expressed dimensions

The obscuring function of the wall is important, but this purely restricting purpose must not be allowed to overshadow the function which grows out of this primary condition A system of wall surfaces, that is, an arrangement in which the vertical screening is made up of separate components (not

necessarily in the same plane) immediately postulates a dual function of *control* and *release* Thus it is possible by means of such elements to vary the degree of visual restriction at any given point within the construction – to induce where desired a deliberate intrusion of external attributes or to grade the 'penetration' (in visual terms) of such attributes – in other words to control the relationship between the space construction and its surroundings Although we are assuming the spectator to be within the boundaries of the system, it can be shown (and this should emerge sufficiently in our examination of the Greek temenos and temple) that the relationship has not a 'one-way' character, but offers significant attributes also when the spectator is outside the physical limits of the system

A house at Tel-el-Amarna (*c* 1400 B C) offers an interesting demonstration of the space-defining, as opposed to a 'practical' or protective, function of the wall in a domestic context In the plan we can see the general arrangement A main wall about 10 ft 0 in high encloses the whole complex, and this is pierced at two points, for the main entrance and for the service entrance Within the enclosure is situated the main structure of the house with its secondary elements – servants' quarters, stables, grain towers, etc Between the forms of the house and the boundary wall, a secondary wall system defines a forecourt to the house, a 'service' court, and a granary court Thus the visitor who enters the main gateway (virtually a propylaeum) enters a space which contains a small chapel and is defined by main walls and secondary walls A further doorway leads into a walled forecourt, which in turn gives on to a porch and so into the house The diminution of implied volume which such an arrangement affords – the grading of space – reflects a dominant sensibility to space construction, and indeed the science of geometry with the origin of which the Egyptians are traditionally associated shows clearly in the deliberate 'artificiality of this scheme

Regarded from the point of view of a spectator who sets out from the house, the expansion from the relatively small space of the house rooms, through the forecourt and the chapel court, to the 'undefined' outer space which contains the whole complex, shows the same relationship with the movement factor (and its visual implications) functioning in the opposite direction.

Considered as a whole, the Tel-el-Amarna house admirably exemplifies the joint proposition of *terrace* and *wall* One need only draw attention, in this respect, to the careful defining of paths by paving; the emphasis on vertical and horizontal *surfaces*, the predominance of the right-angle, and the organic or unified nature of the whole scheme

4 THE COLUMN AND LINTEL

So far in our enquiry the wall has had a simple function in that its stability was dependent only upon the forces generated by its own structural system For an extension of purpose – whether in the realms of visual definition or of practical usefulness – the wall assumes a complex role, for such an extension involves the supporting of further elements outside its own structural unity The wall in combination with the terrace can provide horizontal definition but only suggest vertical restriction The inclusion of

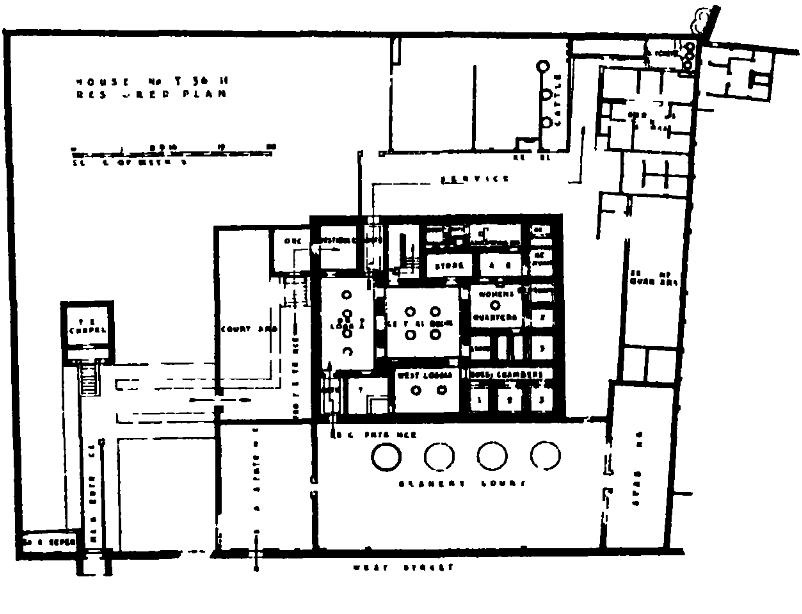


Fig 1 House at Tel-el-Amarna

City of Akhenaten, pt 2 by Frankfort and Pendlebury

a horizontal plane of opaque material at a distance above the original plane of reference encloses a volume, and thus contributes the necessary term for a completely controlled or regulated space system Thus a terrace, four walls, and a roof slab comprise an example of volume construction

We have seen, however, that walls need not necessarily be continuous to maintain their essential function as defining elements, and it is therefore possible (if the materials are structurally adequate) to arrange for complete enclosure in a vertical direction while allowing release and restriction at will in a horizontal direction That is to say, no visual experience is possible upwards because the whole system is covered by an opaque horizontal plane, but lateral experience is dependent upon the judicious arrangement of walls and the openings' which result from non-continuity in the wall system Where the slab has to span from one section of wall to another a lintel is formed, and in the limits the size of openings so formed is dependent upon the strength of the material employed

We can assume a hypothetical arrangement in which a rectangular 'plan' is completed by walls and roof Openings to the system are now defined at bottom, sides and top, and the sections of walling that define such openings bear an intimate relationship a complementary role, to these So long as the frontal area of the wall clearly exceeds that of the openings which it contains we tend to regard the wall as the major element and the openings as secondary If we increase the size of the openings until their frontal area dominates the wall area, the identity of the wall and its traditional character as 'surface' are inevitably reduced and the opening assumes the major role When the predominance is immediately apparent, or when the intermediate sections of wall tend towards a minimum area consistent with structural stability, they can be said to approach the condition of columns

The column, then, is from the point of view of visual cognizance, a special case or development of the wall, and it is characterized by being arranged in a system of repeated units. The lintel is the completing element in a column system, and such a system is thus composed of two columns with a connecting member The full intent of the alternating column and opening arrangement which is usually designated as typically

classical is only given adequate expression when a considerably greater number than two columns is employed. A 'series of columns' is the general expression that corresponds with a terrace and with a wall system

As far as the contribution of column systems to specific space compositions is concerned, in the special sense of modulating and grading spatial experience, we shall encounter their embodiment in the context of city planning and temple arrangement in the sections devoted to these aspects of Greek architecture, so that further discussion on the nature and function of the column will be more appropriately undertaken when these points are reached.

The foregoing interpretation of the elements of architecture has, perhaps, provided a theoretical basis of sufficient range to enable us to move towards a detailed examination of their practical manifestation in Greek architecture

II

THE RANGE OF GREEK ARCHITECTURE — THE CITY STRUCTURE

I THE TOWN AS AN ARRANGEMENT

Town-planning is an extension of architecture It involves in its simplest form the combination of single dwelling units in a recognizable system Although the quality of architecture may exist in each of a dozen buildings, the definition of town-planning cannot be said to have been satisfied from the juxtaposition of units unless the idea of order and arrangement be included in their relationship Mere grouping is primarily the result of expediency Collective safety, convenience, the pooling of resources are all expressions of the gregarious impulse that characterizes man These are the ideas from which the city concept springs The ability to combine and express such ideas in plastic form, however, marks one of the highest intellectual achievements in the history of European culture

Primitive peoples do not normally achieve architecture or urbanism because they lack the faculty of planning and working towards a pre-determined end With technical ability must be grouped the peculiar sensibility that enables the creative impulse to strive for a material expression that goes beyond the minimum demands of shelter and security The hut marks a considerable step from the cave, the house and the city in turn replace the hut and the village

Egypt in her stone architecture initiated a phase of organized surroundings' that was extended by Greece and Rome into the systematized vocabulary that was destined in time to constitute the idea of classic arrangement in building In the splendid pyramid groups of Egypt with their outstretched causeways lies a supreme demonstration of the meaning of geometry Egyptian building is an affirmation of order, it negates confusion and the arbitrary sentimentality of chaos, it is the antithesis of makeshift

Closer to us are the ideals of life that Greece out of her own genius gave to the western world The Greek city is the outward expression of a collective life rich in activities of the creative mind, and its architecture is a timeless exposition of the created background that is truly consonant with its informing spirit Egyptian architecture stated the great fundamental laws of building, Greece infused the shaping attributes of the humanities into the city fabric With new ideals (the very genesis of western culture) came corresponding dimensions in the sphere of civic organization The idea of the city as a corporate whole, as an organic mechanism, in which the parts bear an essential relationship to one another and to the complete scheme, is characteristic of the Greek attitude. We owe the word 'organic' to Aristotle, it stands for a quality of harmonious and integral consistency As a symbol it is as vital in giving meaning to architecture and town-planning as it is in shaping the forms of pure art.

2 BACKGROUND TO GREEK PLANNING — THE MINOAN TOWN

Between Egypt and historical Greece there is an important link Research in Crete during the past forty years has thrown considerable light on pre-Hellenic activities in the Eastern Mediterranean, and has revealed the remains of a civilization that achieved notable proficiency in the fields of applied art and architecture Today, instead of having to accept the notion of a Greek civilization without assessable antecedents (beyond the point of the first Olympiad) we are able to envisage a vigorous and apparently prosperous people whose era dated approximately between 3400 and 1100 B C

What can be said of the 'town-planning' of the Minoans? So far the principal interest has centred on the excavations at Knossos, Phaestos, and Mallia, where great palace buildings have been uncovered, but at which no surrounding towns have as yet been systematically investigated In eastern Crete, however, a small town gives us an interesting insight into everyday life in Minoan times Gournia was a town of farmers It covered the slope of a small hill close to the sea, and on the summit was what Pendlebury[1] terms the Mansion of the Lord of the Manor.

[1] PENDLEBURY *Archaeology* . page 191, 'Gournia, one of the most fascinating sites in the world '

This faced on to a comparatively large public court and had a miniature theatral area

The sloping site of Gournia necessitated terracing, and in fact the part single and part double storey type of house must have been deployed in much the same way as the cottages of the Cretan villages of today The domestic area of the town consisted of rectangular houses separated by narrow roads (or rather footways, for according to Hall[2] the laden beasts of modern Crete could not have traversed these tortuous cuttings) and built "haphazard upon the naked rock", the accompanying plan shows all these points What is important to our present purpose may be summarized as follows

(*a*) The town had in its palace and public court a civic centre, a fact which in itself is a clear indication of the degree of organized living and of communal interests that had been reached by this date [3]

(*b*) The houses were rectangular on plan, and had courtyards In some cases independent structural columns were employed to support the roof

(*c*) The streets though narrow (those at Phylakopi were only 1 5 m wide) were paved with small stones

(*d*) The town plan was continuous and cellular and therefore the result of concerted and collaborative effort

Perhaps the great span of time that separated the Minoan era from that of the true Hellenic civilization would invalidate any attempt to trace a continuity of planning tradition, but the great step from primitive methods of group life which such a town shows, and the close parallelism that can be shown to have existed between its arrangement and that of the mature Greek cities argues strongly for such a hypothesis The palace and public court should be remembered when we later examine the zoning and public building distribution in Greek cities The right angle and the straight line, as Haverfield[4] reminds us, distinguish civilization from barbarism, and in our Cretan town though the roadways curve when the problem of the sloping site

[2] HALL *Aegean* , page 117
[3] GLOTZ Bk. II Chap I
[4] HAVERFIELD Page 14

was too great to be met by a rectilinear system, the 'architect' apparently could not tolerate the amorphous and uncontrolled effect of curved and indeterminate wall systems in the houses The paving of the streets may seem a small point, but this refinement reflects not only a keen practical sense, but also a cognate attribute of desire for formality that we must recognize

The continuous nature of the plan of Gournia, and the repetition of approximately standardized dwelling elements with courts indicates a conceptual attitude to the problem of spatial and constructive technique Hall is a little severe when he stigmatizes these Cretan dwellings as being placed haphazard,[5] for the adjustment of formal construction to existing site demanded extreme ingenuity in the face of a rigidly postulated planning system for the dwelling units themselves

Let us glance for a moment at one or two other factors that have a bearing on the Minoan attainments in organized building The size of the town would seem to be determined by the productive factor of the surrounding country, for with primitive methods of transport and poor communications the problem of commodity supply and distribution in the case of a large population in a single town would be extremely difficult to solve Consequently the size of a town tends to reflect the agrarian or other form of stability of its immediately accessible surroundings The Minoan towns appear to have been virtually unfortified, and in the case of the large palace buildings such as those at Phaestos the resultant architectural freedom can be seen in spacious entrances, outward-looking loggias and broad paved terraces which command magnificent views over the countryside, as well as providing a generous and orderly setting for state affairs [6] Although the houses of the people were small judged by present standards, with their private courtyards and close contact with rural surroundings they must have provided more than tolerable accommodation

Concerning structure, we may note that stone and sun-dried brick walls were common, and according to Hall the houses were plastered externally and 'no doubt gaily painted' [7] The

[5] HALL *Aegean* .. page 117
[6] For a full survey of the palace buildings at Phaestos *see* PERNIER 2 vols.
[7] HALL *Aegean* ... page 115

series of faience plaques from Knossos representing two- and three-storied façades provides valuable evidence in this connexion [8]

With regard to the demonstrable sensibility of the Minoan people (quite apart from the sense of arrangement shown in their architecture) it is necessary to cite only one significant fact The Minoans used for everyday household purposes pottery of extreme beauty, not only in shape and colouring but in the fertile imagination of its pattern motifs Throughout the complex developments and separations of local idiom there is a constant spontaneity and direct appeal in all their ware which must evoke an appreciative response even today The vase from Phaestos (*Plate* 2) suggests without the necessity of further discussion the kind of people who must have lived in Crete This household pottery is only a facet of the architectural interior, but even if it is a minor element in the space arrangement of the small house it is a reliable indicator of the standard of visual and critical selection reached in these times Of a more complex order were the spatial relationships achieved in the architecture of the palace That at Phaestos, for example, is notable in this respect, but we have seen sufficient for our present survey to move towards Greece

3 MYCENAEAN PLANNING – A MAINLAND ACROPOLIS

The key to the next epoch to be considered is the settlement of Mycenae which has given its name to the era that bridged the period between the decline of Crete and the growth of Hellas Mycenae is boldly situated on a spur of the mountains of Argos, and must have commanded a strategic position in the time of its occupation With the collapse of Crete [9] and the move northwards of the centre of Aegean power a sombre chapter in pre-Hellenic history opens The unprotected type of Minoan town is abandoned and in its stead we find a fortress, its site chosen with a view to military expediency, and its architecture

[8] EVANS Vol I

[9] Professor Haarhoff reminds me that the Mycenaean buildings date from some centuries before the final collapse of Crete in 1100 B C., and points out that the Achaeans had been absorbing Cretan art and civilization from about 1400 B C He attributes the fortress character of Mycenaean building partly to the use of traditional building methods and partly to invaders against whom there was no protective barrier of sea as in Crete

reflecting an era of insecurity and intellectual darkness Picturesque though its setting appears to the traveller today, Mycenae can only be interesting for the present thesis because it shows the early establishment on the mainland of Greece of the acropolis type of settlement With its massive gateway and encircling walls of stone it is a forecast of the sanctuary of later

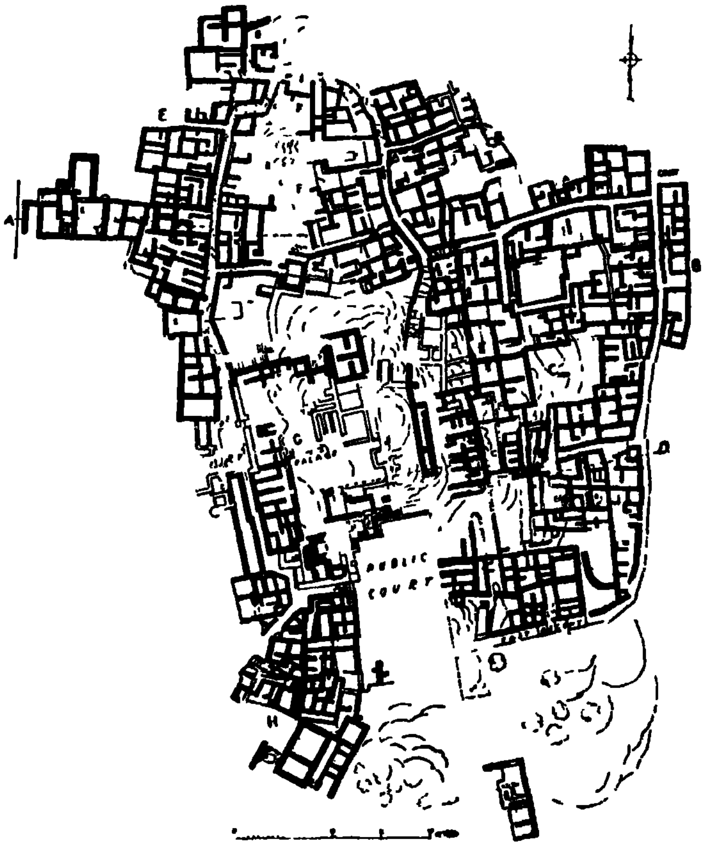


Fig II Remains of the town of Gournia, East Crete Situated on the Bay of Sitia, and dating from the Middle Minoan period

Hall *Aegean Archaeology*

times where buildings and enclosures for the gods echoed these early arrangements of practical necessity Although the craftsmen of Minoan Crete may have been absorbed by the mainland hegemony (the so-called Mycenaean pottery and decorated gold cups found on the mainland indicate such a process) the spirit of free creation was dead There are no signs of a peaceful maritime or agricultural existence, but only the shadow of a warlike people who lived strenuously and built against invasion

The plan shown indicates the general scheme of utilizing the area covered by the acropolis Immediately inside the main gateway (A on plan) and at the beginning of the escarpment lies a grave circle (C), and beyond this on about the same level appears to have been a continuous group of dwellings (E) High above these dwellings lay the palace, the megaron arrangement of which is shown at (G) In this early example of zoning (whether dictated primarily by practical considerations or ritual) we see a suggestion of system, of attention to deliberate planning which was ultimately to flower into the balanced and architectonic arrangements of later centuries

4 HISTORIC GREECE – THE PLANNING OF TEMPLE SANCTUARIES

A consideration of the development of town-planning on the mainland of Greece at the beginning of the Hellenic era is beset with many difficulties Literary evidence has been freely accepted as giving a true picture of living conditions in classical Greece, by indicating a wide divergence between public splendour and private amenity Archaeological evidence is in constant process of widening our knowledge of these conditions, but only gradually as each fresh discovery is made can we put together the facts for a complete survey of urban life There seems little doubt that in discussing the appearance of Periclean Athens the historians have overstressed the poverty and meanness of private dwellings and minor streets in comparison with the great public buildings and processional ways Robinson's excavations at Olynthus have shown us that orderly 'suburban' layouts were not the prerogative of later epochs, nor does there seem to be sufficient evidence to say that Athens was "an almost

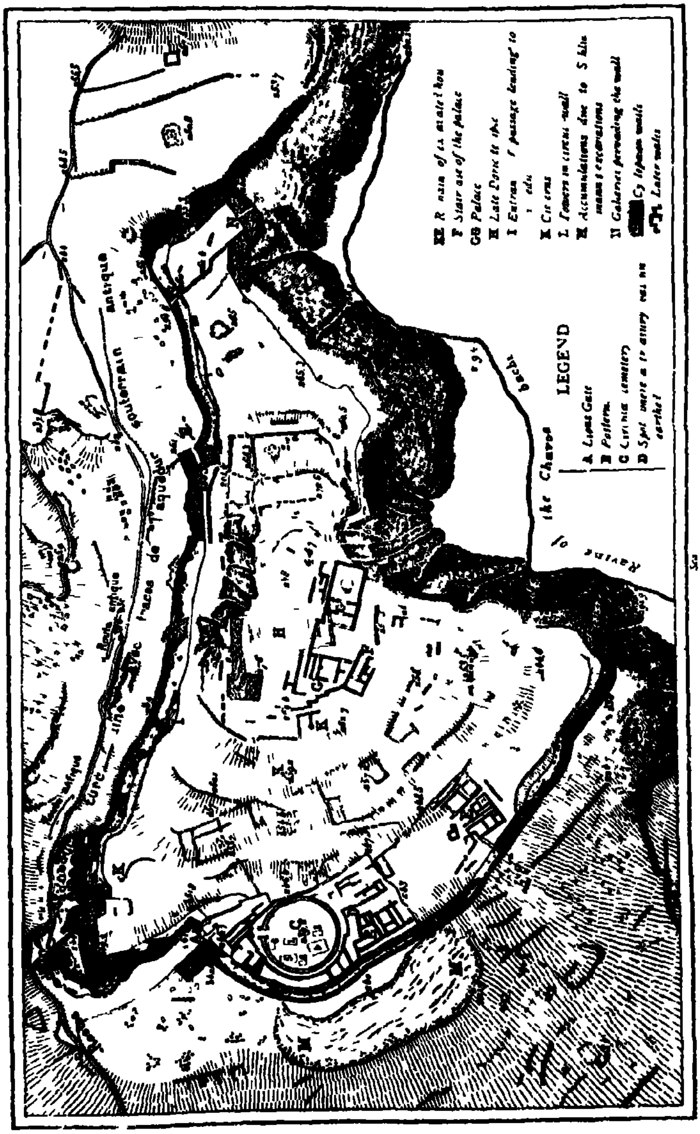


Fig III The Citadel of Mycenae
Perrot and Chipiez *Art in Primitive Greece*

Oriental mixture of splendid public buildings with mean and ill-grouped houses"[10]

In default of definite evidence, however, (and this is always difficult to obtain where the town as a living and decaying organism gradually obliterates all traces of its original form) we may accept the current assumption that Greek towns of the seventh and sixth centuries B C showed a stateliness in their public buildings that was not echoed in the 'half-barbarism' of their side streets In very early times, whether under the influence of Babylon or not, the idea of a generous processional way seems to have been established in Greece and her colonies References are made by ancient writers to paved roads for religious processions, and although these latter would not approach in volume the 'spectacles' of the great Hellenistic cities with their vast watching crowds, they indicate a growth of civic consciousness that called for a corresponding architectural expression

Without embarking on a full discussion of the arrangement and treatment of buildings for civic religious purposes at this stage, we may note briefly that the architectural ingenuity that was expended upon such groups of buildings as those at Athens, Delphi, and Epidaurus cannot have been without influence in the field of purely civic planning According to d'Ooge[11] the Acropolis at Athens in pre-Hellenic times grew more and more to be a place of sanctuary, serving also as a place of royal residence and as a citadel As at Mycenae it formed the fortress-capitol around the base of which grew a settlement In early historic times the process of adorning the city and building temples was undertaken out of the revenue from taxes The rich building material of Attica was now exploited, and the great Panathenaic festivals with their musical and other contests were instituted

The completion of the group of buildings on the Athenian Acropolis set standards for 'civic' architecture that not only inspired Greece herself, but served as a symbol of supreme plastic arrangement for succeeding cycles of architectural endeavour

[10] HAVERFIELD Page 28
[11] D'OOGE Page 14

5 FORCES IN CITY DEVELOPMENT— EIGHTH, SEVENTH, AND SIXTH CENTURIES B C

Reference to the arrangement of temple sanctuaries has carried us into the fifth century B C and it is necessary to return to an earlier point to pick up the thread of city development as it was influenced by factors other than those dealt with above We have seen in pre-Hellenic Mycenae and Athens the predominance of defensive and religious influences In historic times three factors seem to have shaped the city organism. According to Hirschfeld[12] these were, (*a*) Military, (*b*) Economic, and (*c*) Aesthetic In other words, in establishing a town site the strongest position which also offered remunerative prospects and beauty in its topography would be selected This joint practical and philosophical background colours the whole conception of the Greek 'polis', and the completion of the Synoikismos (or union of all Attica) towards the end of the eight century B C [13] must have been reflected, if not immediately, then with growing clarity in the architecture and town-planning of Greece

In Athens, for instance, the Agora superseded the Acropolis as the centre of civic life, and in its situation north of the Areopagus it lay convenient to mainland and harbour Adjoining it was the Ceramicus, "the centre of the most flourishing manufacture of Athens"[14] This politico-economic adjustment of established traditions shows a concession to material considerations, and incidentally the important function of the agora renders it unlikely that the religious citadel had a monopoly of architectural splendour

The emergence of the isolated village into a state of being grouped under a controlling centre would naturally result in a concentration of public buildings (with a corresponding increase of impressiveness architecturally) in such centres Pausanias describing Panopeus in Phocis implies a clear distinction between village and city in that the latter has government offices, gymnasium, theatre, market place, and fountain[15]

[12] LAVEDAN Page 114, note 1.
[13] CARY in Cambr Anc Hist Vol. 3, page 580
[14] CARY op cit, page 581
[15] PAUSANIAS Bk X, IV, 1

Of the non-practical aspects of the city, that of the Greek attitude to the city as a pure projection of human effort and therefore capable of being symbolized as a 'personality' is evidenced in a variety of forms Gardner in an extremely informative paper[16] mentions the essential difference in attitude to representation shown by the Egyptians and Assyrians of their cities These earlier civilizations commonly depicted the idea of the city in "as naturalistic a manner as possible" The Greek tendency, however, "to clothe all kinds of powers and abstractions in human form" was maintained when the artist sought to give plastic expression to the character or central inspiration of his city

This conception of the city as being foremost a 'body politic' or as being a union of persons rather than a group of buildings is a significant reflection of the axiom that man is the measure A constant search for the meaning of life and the visible world coupled with a passion for self-expression penetrates every department of Greek activity, and it is in the embodiment of the history and in the indication of the character of its people that the Greek city carries so much interest for later cultures Among the Greeks "the city was more homogeneous, more fully organised more unified than among us, was more of a person and less of a place"

For our present purpose what we may infer from Gardner's analysis of the representation of the city in Greek art is that the indivisible unity of the city idea apparently denied the feasibility of pictorial representation of portions of the city which for instance today would readily be accepted as adequate in symbolizing or suggesting the whole. Such fragmentary indication of the whole by the part which is commonplace today had no significance for the Greek, and indeed is demonstrably alien to the Greek conception of material unity

The problem of suitably conveying the idea or the 'genius' of the city involved, therefore, a metamorphosis into a new medium The 'personality' of the city which has no connexion with any represented physical or material aspect of its appearance thus is shown in human guise, a process that reflects in its complete cycle initially the infusion of human, or personal, qualities into a material fabric which was created for the needs of practical

[16] GARDNER (*J Hellen Stud* 9 47–81, 1888)

existence, and then re-distilling those qualities and expressing them in some form of ideal personification Such expression was usually given in the representation of the guardian diety or of the eponymous hero or founder of the city

Gardner describes a series of small marble reliefs of the fifth, fourth, and third centuries B C. which were placed at the head of certain decrees of the people, and to which they formed "an illustration or a sort of frontispiece" On one is shown the virgin goddess of Athens, on another Heracles Through the medium of coins too, we find the representation of the guardian deity, and we may note in the case of a coin of Ephesus and Miletus that Miletus was symbolized by the archaic statue of Apollo which stood in the Didymaeum in that city, and that Ephesus was similarly represented by an image of its deity

The city then was considered to have a personality of its own, a completeness which the Greeks found more akin to the union of their own bodies and minds than to the idea of a merely quantitative and practical habitat for the population The evidence of this attitude here summarized may help us to a clearer understanding of the steadfast shaping towards perfection and architectural unity that characterized the progress of town-planning in the Greek world At any rate it would be as well to bear in mind a concept that must undoubtedly have exerted a continuous though intangible influence on the civic conscience

The expansion of Greece in the eighth and seventh centuries B C both in the foundation of colonies and in the growth of her industries laid the foundation for a full and enlightened expression in civic planning in the two succeeding centuries The rise of the great commercial cities dates from this period Miletus, Chalcis, Aegina, and Corinth testify to a new vitality and trade intercourse over a wide area Agriculture still provided the general stability, but was supplemented by the manufacture of woven cloth, pottery, etc The coining of money quickly spread over Greece and new sources of trade were opened up [17] The intellectual supremacy of the Ionians was now established, and the philosophers of the sixth century inaugurated the bases of science with a strong mathematical bias The Ionians also showed considerable preoccupation with the necessity for the

[17] HICKS in Whibley, page 83

conversion of theoretical principles into the fields of practical application

Although the honour of the first essays in town-planning may go to the tyrants of the sixth century B C ,[18] detailed evidence for formal planning on a wide scale does not seem to go further back than the fifth century

6 SELINUS – A COLONIAL CITY

Of the colonial cities of Greece, Selinus in Sicily shows a controlled treatment of an interesting site, but the dating of the plan presents many problems Selinus (*Plates 7 and 8*) was founded in 628 B C [19] and destroyed about 200 years later, but whether the plan can be dated at the end of the seventh century or in the fifth century (during which the city underwent a period of great prosperity) is difficult to determine Haverfield[20] is non-comittal, Randall-MacIver[21] does not comment on this point other than to note that there is no detailed record of its life during the sixth and fifth centuries Myres[22] refers to the "systematic construction of this new city", and Unwin[23] assumes the plan of the acropolis to date from 575–560 B C On the face of it there is little to influence us against accepting the date of her great Doric temples as the date of her city plan

Fougères,[24] however, places Selinus as almost contemporary with Hippodamus the Milesian town-planner, and states that the houses which line the streets are also of the end of the fifth century B C Hulot's plan shows the type of house built at Selinus, and these were, according to Fougeres, of an extreme simplicity and uniformity The plain façades and peristylar court arrangements appear to have been identical with those of the houses of Delos, and similar to those excavated at Olynthus It is difficult to reconcile this late date with Myres's reference to the "new" (*i e* as originally founded) city Nevertheless if we examine the elements of the plan arrangement in relation to the

[18] LAVEDAN Page 114
[19] BURN Discussion on dating of foundation of Selinus *J Hellen Stud* 55 135, 1935)
[20] HAVERFIELD Page 33
[21] RANDALL-MACIVER Page 214
[22] MYRES *in* Camb Anc Hist Vol 3, page 682
[23] UNWIN Page 27
[24] Quoted by UNWIN Pages 27–28

buildings of Selinus there is much to indicate a late date – at any rate the beginning of the fifth century – for the plan.

The actual configuration of the temples enables us to establish the date of the uniform rectilinear plan only in a negative manner, since it is quite conceivable that an informal street system might have originally been complementary to the 'loose' and asymmetrical arrangement that exists in the two large temples, and in the group of four temples considered as a whole. Indeed it is extremely difficult to suggest analytically a *raison d'etre* for the group arrangement (considered specifically in relation to the major axes established by the north-south and east-west streets) if it is postulated that the date of the upper (and older) temples is the date of the formal city plan

Of the four temples it is significant that 'A' and 'O' in the southern portion of the sanctuary date from 490 B C, and although Hulot shows these temples hemmed in by blocks of houses to east and west, they are situated in a formal rectangular temenos and are parallel to the main street above them The large temples 'C' and 'D' above, which were built in 570 and 560 B C respectively display as a group no parallelism or assessable alignment with the street system, such as exists in the case of the later temples 'A' and 'O'

Suppose that the earlier temples were situated in the city without a deliberately rectilinear system, and that the imposition of such a system were undertaken in the fifth century The position of temple 'D' would then mark the eastern limit of a main north-south axis, and, taking into account the general shape of the acropolis, temple 'C' would define the position of the main cross street These earlier temples are thus given a generous enclosure which firmly resolves their independence within a defined area The latter temples being contemporary with the new scheme would be easily incorporated in a unified pattern Weight is given to this general hypothesis by the unusual and un-Greek contiguity of the west front of temple 'D' with the main street of Selinus It would be difficult to argue for the deliberateness of such an arrangement (which is not echoed elsewhere in Greek temple schemes) as a unified process unless it is agreed that the temple was built first, and that the closeness of the street is a result of expediency in a scheme which had to incorporate existing and inviolable monuments.

Our argument is, of course, not conclusive, nor does it sift in detail the minute considerations that would have to be weighed for a definitive judgement It does show, however, that there is some evidence for the view that the city plan dates from the fifth century

Apart from this central problem, we may note the fine setting that contains temple 'D', and that merges with that of temple 'C' Hulot suggests a lengthy stoa to the north and another to the east of this open space If such an arrangement is an accurate reconstruction of what actually existed, the setting for festivals and ceremonies must have been a fine one It would seem from such emphasis that the early temples maintained their importance to the end of the life of Selinus, and that the smaller and later buildings to the south did not rival these in the eyes of the city dwellers

Whatever forces generated the arrangement of the religious sanctuary as a whole, the final plastic effect is of great interest The temples no doubt lost something of their aloofness by the unwonted intimacy brought about by the new street system, but the variety and vigour of the grouping that resulted are a compensation to our eyes at least The Doric temple seen from the sea is always peculiarly inspiring, and one can visualize the significance to homecoming sailors of the first glimpse of their town with its commanding temples in sharp outline against the sky

That personification of the city which we have seen earlier, that attribution of a collective 'soul' which made a city more than a group of buildings implied a pre-eminent importance in the city temples On plan they dominate the city, seen from afar they rise above the houses in massive splendour To us they suggest the idea of a benevolent protective deity around whom are clustered a group of privileged dwellers, spiritually secure in the shadow of the great houses of the gods

7 FIFTH CENTURY AND FOURTH CENTURY – THEORY AND CONSOLIDATION

Three important cities, planned on a unified scale and dating from the fifth century, must now be mentioned Thurii in South Italy (443 B C) the Piraeus (479 B C) and Rhodes (408 B C)

The design of these three towns has been attributed to Hippodamus of Miletus who was born about 500 B C If, however, he was responsible for the planning of the Piraeus (which we may accept) it is extremely unlikely that he would have been in a position to plan Rhodes

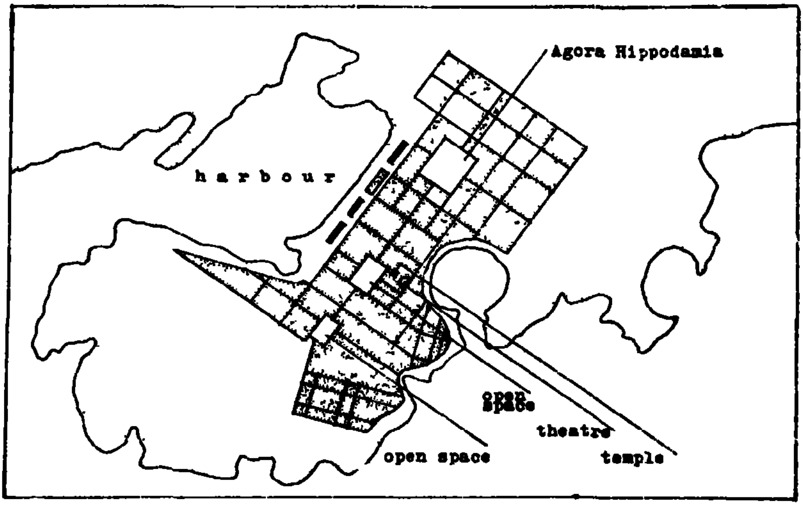


Fig IV The Piraeus
After Milchhoefer

Hippodamus has become rather a legendary figure, and the idea seems to have been widely and uncritically accepted that he was responsible for introducing regular city planning. Actually the so-called Hippodamian system was not Greek in origin, nor did it make its first appearance in the fifth century Hippodamus can be accepted, however, as standing for a universal recognition of the formal and geometric approach to the problems of town-planning He appears to have been well established in Athens as a protegé of Pericles during the richly constructive years of the fifth century, and whatever the justification of the claim to his being the founder of the new science of town-planning, the illustrious background of his own city must have stood him in good stead

Athens at this time was widening the range of her commercial activity, and the Piraeus underwent a corresponding development as her mercantile port The opening was an obvious one

for a town-planner of overseas repute, and it is not difficult to picture the modernization of the old port on a rational basis as a key political undertaking of Athens Exchange buildings, warehouses, and sample rooms lined the quays, and according to Tod's picturesque description[25] "Behind lay the city itself, with its teeming cosmopolitan population, its shrines of Greek and of foreign gods, its shops, its inns, its broad straight streets crossing at right angles according to the design of the famous architect and political theorist Hippodamus of Miletus – the earliest application on a large scale of a town-planning scheme'

The first half of the fourth century probably saw a wide consolidation of town-planning control and management By-laws relating to the general order of the streets and markets, and the appointment of officials for their supervision are referred to in contemporary inscriptions[26] Laws controlling the building of houses, the restriction of balconies over the streets, indicate the recognition of the town as an established institution at this period

Of the theoretical attitude to the problem of town arrangement one of the most interesting statements is that made by Aristotle[27] Although his intentions are not always clear, and the brevity of his remarks leaves much untouched, he gives a clue to the various departments of planning which formed the bases of fourth century city design The need for a healthy situation is stressed, and "the site should likewise be convenient both for political administration and for war There should be an abundance of springs, or if there is a deficiency in these, reservoirs must be built The arrangement of private houses is considered to be more agreeable and generally more convenient, if the streets are regularly laid out after the modern fashion which Hippodamus introduced But for protection in war Aristotle advocates the "antiquated system" of irregular streets which assists defence, so that the ideal city will contain two types of layout - regularity for beauty and confusion for security It is not quite clear how such a scheme would be carried out in practice as a deliberate programme, although the rebuilding of parts of a town may give a similar effect

[25] TOD in Camb Anc Hist Vol 5, page 19
[26] HAVERFIELD Page 37
[27] ARISTOTLE Page 315 ff

Of the requirements of the citizens as a whole Aristotle says there "should be established an agora, such as that which the Thessalians called the 'freemans' agora', from this all trade should be excluded, and no mechanic, husbandman, or any such person allowed to enter, unless he be summoned by the magistrates There should also be a traders' agora, distinct and apart from the other, in a situation which is convenient for the reception of goods both by sea and land The magistrates who deal with contracts, indictments, summonses and the like, and those who have the care of the agora and of the city respectively, ought to be established near an agora and some public place of meeting, the neighbourhood of the traders' agora will be a suitable spot, the upper agora we devote to the life of leisure, the other is intended for the necessities of trade "

In these few statements we have a clear indication that a formal framework of related organizations was postulated as an ideal basis from which to develop a city plan Adequate zoning, public space, and control, suitable aspects and sites for different purposes are all implied by Aristotle, but, (as he concludes his remarks on town-planning) "The difficulty is not in imagining (these details) but in carrying them out, the execution of them will depend upon fortune " How far these propositions were given expression in actuality we shall see later in our examination of Hellenistic planning

8 ELEMENTS OF THE GREEK CITY

(*a*) *General* The Hellenistic era (330-130 B C) inaugurates a philosophy of town-planning that is splendidly expounded in the crystalline cities of Ionia Miletus and Priene show a brilliant culmination of the laboriously built-up heritage that went to their making The established standards – products of centuries of research – of building and co-ordination on a civic scale are gathered up in the single fabrics of these cities. Architecture has found a framework, it is no longer a series of isolated fragments of virtuosity – it is the medium of the whole city pattern The processional way, the colonnade, the agora, the theatre, the temple, the house combine in a pre-determined scheme Their individual values and functions have been assessed and co-ordinated, they are subject to a plan that is the

product of a whole vision We may be justified in saying that the political Synoikismos of ancient Attica which pooled resources and moulded a new civic organism was the distant generator of this new and triumphant aesthetic synthesis

As a single instance of the process of selection and consolidation in the elements of city architecture let us consider briefly the progress of the Doric columnar system which in itself represents a constant underlying theme in all the architectural activities of the Greeks The Doric system was employed as early as the seventh century B C in the temple of Hera at Olympia, and underwent a change so gradual, and fundamentally so much of degree rather than of kind that we must regard its growth to final appearance as a demonstration of the characteristically Greek method of working to a progressive standard The basic acceptance of an architectonic-structural system, and the preoccupation with its modification in minutiae over a period of 400 years is, perhaps, unique in the history of architecture The Doric system as incorporated in the temple was subjected to a wide geographical distribution

After its early occurrence on the mainland of Greece we find the system vigorously exploited in Sicily in the great temples of Selinus and Acragas At Paestum, too, the order attains a fullness of profile and a sheer exuberance of form[28] that indicates a spirit of colonial daring which is later modified to less robust proportions in the temple of Aphaia at Aegina, and in the temple of Zeus at Olympia This 'transitional' period on the mainland is followed in the fifth century by the refined and compact expression that occurs in the Theseum and Parthenon at Athens, and in the temple of Poseidon at Sunium Finally one may note the use of Doric in the temple of Asclepios at Epidaurus, a relatively small hexastyle peripteral construction which was built about 380 B C 'Perfection' in the Doric order, which one may suggest was only lacking in the Parthenon because of the overstatement in its octostyle arrangement, is here attained in the context of the religious sanctuary Epidaurus marks the close of a long process, it is the final flowering of a specialized application

[28] Professor Haarhoff has suggested to me that this manifestation reflects the native Italian 'ubertas' (richness) which is seen in the literature, agriculture, oratory, and general character

[a] HAARHOFF Page 175

We may now turn our attention to the nature and range of the 'standard' public buildings that were essential units in the Greek city It would be impossible within the limits of this section to trace fully the historical development of all the institutions of the Greek city, but we may consider the aspects that have a bearing on our present investigation [29]

(*b*) *The Stoa* The stoa is a logical extension of the idea of an open meeting place which latter in its simplest form offered no shade or protection to the populace (*Plate* 6) The stoa was essentially an extended portico, the rear wall of which was sometimes pierced to give access to a row of shops backing it Where the site called for a more complex arrangement (as at Assos in Asia Minor) the stoa was constructed in several storeys, "the colonnade itself facing on the agora, and beneath it one or two storeys which were probably utilized as markets' [30]

The stoa or so-called 'Echo Colonnade' that flanked the treasury terrace and faced the great temple of Zeus in the Altis of Olympia dates from the fifth century B C , but was according to Gardiner rebuilt in Hellenistic times when it was known as the Stoa Poikile, a name which reflected the wall painting that decorated it Gardiner summarizes the position and function of the stoa in the following statement 'These stoae were a distinctive feature of Greek life We find them in all places of public resort, in or around the agorai, or the Gymnasia, in sanctuaries like Olympia and Delphi They were lounges or promenades where people could walk sheltered from the heat or the rain and watch the busy scenes outside " There is some affinity between this element and the theatre, for as Gardiner further remarks 'The Echo Colonnade at Olympia commanded a unique view of all the ceremonies in the Altis '[31] Its purpose was not always merely that of a vantage point however, for the Stoic school took its name from the Stoa Poikile at Athens, where Zeno taught; and the stoae of the Piraeus served as exchanges Apart from its relationship to the agora which we shall examine later there is an architectural importance which may be exemplified in a final reference The

[29] The House will be considered in the next Section
[30] ANDERSON SPIERS, and DINSMOOR Page 176
[31] GARDINER Page 275

Stoa in the sanctuary at Epidaurus, against which are arranged the Temple of Asclepios and the Tholos, provides a formal plane of definition for a plastic composition that is dynamic in its asymmetry The contrasting plan shapes of temple and tholos and the interstitial grouping of statues and shrines are given a final resolution and stability by the 'monotony' and repose of the stoa

The growing application and formal use of the stoa in the post-Hellenic period would seem to justify Fyfe's estimate that it was "the most important plan unit of Hellenistic times" [32]

(*c*) *The Colonnaded Street* Although the use of the colonnaded street seems to have been widespread only in Roman times, it must be mentioned here In the Hellenistic era it seems to have been mainly employed in colonial towns where climatic conditions demanded more protection than the stoa was capable of providing According to Bosanquet[33] this type of street had its origin in Antioch and Alexandria At Ephesus the colonnaded street added to the monumentality of the city but, as Bosanquet points out "the real value of these streets lay in the protection which they afforded from summer sun and winter rain (for) the increasingly gorgeous and perishable clothing of the Hellenistic and Roman East was little fitted for exposure to rain"

(*d*) *The Agora* The agoras in Hellenistic times were of two main types (*i*) Places where the populace assembled to hear the proclamations of rulers, officials, etc, and (*ii*) Places of meeting for the transaction of public or private business In either case the agora in its mature form consisted of a large open area, rectangular or trapezoidal in shape, and surrounded by stoae The civic type of agora often included temples within its space as well as public fountains and statues, the bouleterion, prytaneum, and other important buildings were grouped in the immediate vicinity The commercial agora was usually surrounded by shops and stalls and presumably temporary shelters of many types were set up in the open

It appears that in early times the agora was an irregularly

[32] FYFE Page 157
[33] BOSANQUET (*Town Plann Rev*, 5(4) 287, 1915)

shaped area at the intersection of important streets, and only in the growth of the corporate idea of a city did it assume any degree of formality Lavedan suggests that its initial political function was modified with the passage of time into one having an economic basis, but that at all times it remained a place of pleasure and recreation [34] In the Homeric era only the political aspect is reflected, but by the end of the seventh century B C commerce invades the agora, and the small merchants with their foodstuffs, pottery, wine, and perfume, ply their trade freely in this area Following attacks by legislators and philosophers on this abuse of the civic function of the agora we have indications of a clearer zoning of activities.[35] Pericles, for instance, constructed a special market at Athens for the sale of cereals.

In general one may say that the agora was placed centrally in the city plan, although in the case of seaports having only one agora this was usually situated at the quay Such towns were Rhodes, Alexandria, Thasos, and Delos It must be noted that many inland towns also had only one agora, as for example Corinth Concerning the form of the agora there are at least two types The ancient mainland arrangement, irregular, and with a number of apparently unrelated stoas which provided only a partial enclosing structure, and the so-called new type which as evidence indicates, had its origin in Ionia and was introduced into Greece by Hippodamus

The agora of the Ceramicus at Athens illustrates the first type For examples of the second type we may turn to Priene, Miletus, Magnesia, etc, where the agoras are not only strictly geometrical in plan but bear a measurable relation to the city area At Priene[36] the agora occupies the equivalent of two insulae, at Magnesia six, at Miletus [37] (south agora) sixteen The plans of these towns show the manner in which the agora was related to the street system, and the variations in detail that were necessitated to meet local conditions Of the regular type of agora on the mainland of Greece in the post-Periclean period may be mentioned those at Megalopolis, Orchomenos, and Argos. Complete enclosure is found at Tegea, Messene, and Delos

[34] I am indebted to LAVEDAN, page 169 for the substance of this paragraph

[35] LAVEDAN

[36] WEIGAND and SCHRADER

[37] MILETUS Bd 1, Hft 1, 2, 3, 6, 7.

Rectangular treatment appears to have been almost universal, the most notable exception of the Hellenistic epoch being that at Assos[38] where the non-rectilinear arrangement has great vitality and retains for its basis a formal stoa system

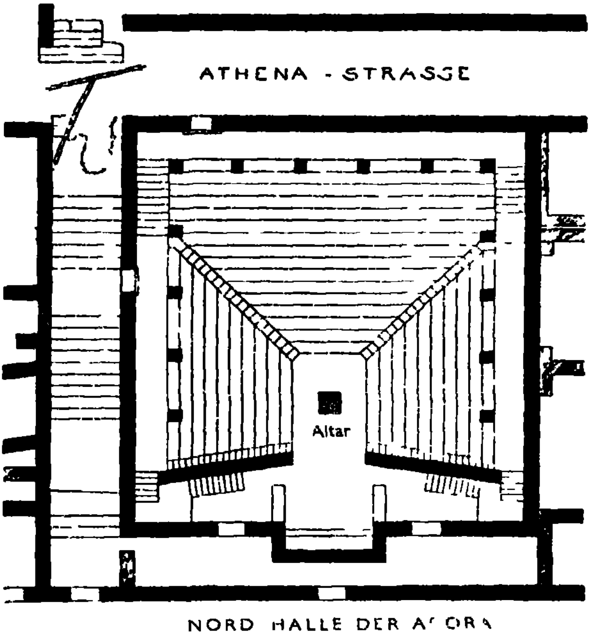


Fig V Plan of the Ecclesiasterion at Priene
Wiegand and Schrader *Priene*

(*e*) *The Bouleterion and the Ecclesiasterion* The best known examples of these two classes of building are those at Miletus and Priene The history of the Boule or Council from which the former type takes its name is an extended one Gardiner mentions a special council house having been built in the sixth century B C or earlier for the deliberations of the Boule at Olympia[39] The peculiar plan of this building may have resulted from a rebuilding on old foundations At any rate the central row of columns in the two main halls recalls the archaic

[38] GERKAN Plan of agora at Assos
[a] *Amer J Archaeol* 2 Ser 1 1897 pls 4–8.
[39] GARDINER Page 270

Doric temple plan such as that at Thermum The similarity of this early type of Council Chamber to the simple stoa is apparent, its development into what amounts to a small covered theatre dates probably from Hellenistic times, and at Miletus we see a mature and architecturally significant expression of the functions and standing of the council on which the responsibilities of the city rested The Bouleterion at Miletus[40] was built about 175 B C, and was situated at the end of a large peristylar court which was entered through a central propylon The building itself seated about 1500 people on the ancient theatre system which in turn was contained within a roofed rectangular space The general architectural treatment is Doric, but with a strong Ionic influence

The smaller and simpler Ecclesiasterion at Priene was intended for popular assemblies and held about 700 people Its situation against the Prytaneum suggests a close practical link in the functioning of these two public buildings The Ecclesiasterion was a roofed structure measuring about 66 ft each way What remains of the walling indicates that the building approached monumentality only in its interior treatment, the exterior being carried out in simple masonry This restraint is an interesting comment on the discrimination that had been reached by the end of the third century We may note that the sloping system of stone seating followed the main inclination of the site, so that a door in the rear wall was level with the street above The main entrance was in the south side

(*f*) *The Gymnasium and the Palaestra* The gymnasium was an important element in every Greek city, and in fact the larger cities had more than one Periclean Athens had three gymnasia, and in later times apparently an even greater number The palaestra or wrestling school was sometimes combined with the gymnasium, the latter in its simplest form consisting of an open court surrounded by a colonnade The various exercises took place, in more elaborate examples, in different halls and rooms The gradual intrusion of elements of the population not actually concerned with exercise rather widened the scope and accommodation of the original simple structure Perhaps the

[40] MILETUS Bd 1, Hft 2, for reconstruction drawings, photographs of remains etc of the Bouleterion

best known examples are those at Olympia, Epidaurus, and Priene

At Olympia, where there was no resident population, the palaestra and gymnasium had only a limited and specialized purpose The latter was originally a large quadrangle with at least three enclosing porticoes, one of which served as a covered running track The palaestra consisted of an open court about

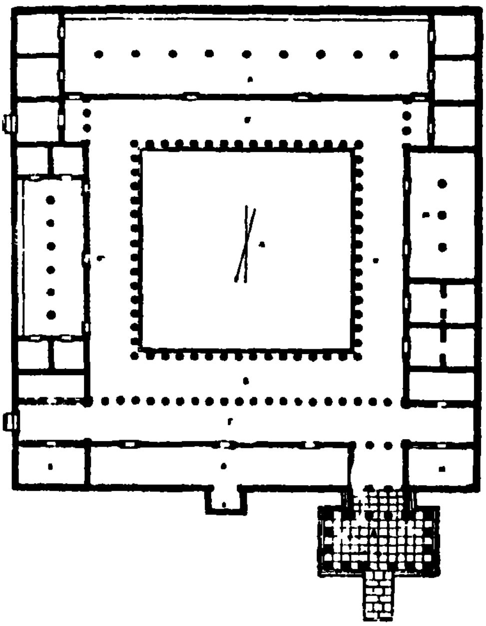


Fig VI Plan of the Palaestra at Epidaurus
Anderson, Spiers, and Dinsmoor *The Architecture of Ancient Greece*

130 ft square, surrounded by a Doric peristyle Outside this were the numerous dressing rooms, vestibules, etc Bathrooms, storage rooms for oil, sand, and athletic apparatus occupied some of this space Most of the rooms opened on to the peristyle with two or more Ionic columns in antis In several rooms were statues of gods, heroes, or athletes, and in some, stone benches for spectators and competitors Both buildings appear to date from the third century B C [41]

[41] GARDINER, Page 288 ff

Another site of a specialized character was Epidaurus, the most celebrated centre of the cult of Asclepios, where in addition to the temple group previously mentioned, there were provided hospital, palaestra, and stadium This very interesting group of buildings with the beautiful fourth-century theatre nearby is perhaps the equivalent of a health resort, and offers a parallel to the group at Olympia where the athletic festival gave a special meaning to the type and arrangement of architectural elements At Epidaurus the palaestra had much in common with the Olympic example It is more complex, however, and architecturally more subtle than the latter As far as one can judge from the excavations an air of spaciousness and some luxury must have been achieved in its construction

At Priene there were two gymnasia, the upper and smaller one which was simple in plan and easily available to the northern element of the population, and the lower gymnasium attached to the stadium Both contain the established elements and testify to the continued importance that was attached to physical fitness by the Greeks

(*g*) *The Theatre* The idea of the theatre in Greece may be said to have originated with the choric dances in honour of Dionysos which were held in or near his sacred precincts The stage was probably the outcome of having to provide the actors with some form of platform above the chorus so that they would be visible to the spectators "The spectators would group themselves on the further side of the dancing-place (orchestra) which would be chosen, if possible, in such a position that a natural slope of a hill would enable a crowd to see and hear well what was going on "[42]

This direct adaptation of existing sites to the needs of an auditorium is the germ of the fully developed Greek theatre with its paved orchestra, architectural skene, and vast construction of stone seating Of the arrangement in the fifth century B C, there is only scanty evidence, but by the fourth century examples are to be found in every city of importance in Hellas Some are in a better state of preservation than others, some in more beautiful situations, but the basic form and underlying principle are identical in every case Of the better known theatres one need only mention those at Syracuse and Segesta in

[42] GARDNER in Whibley Page 417

Sicily, at Athens, Epidaurus, Argos, and Delphi on the mainland of Greece, at Assos, Pergamum, and Priene (*Plate* 4) in Asia Minor [43]

The theatre at Epidaurus designed by the younger Polycleitus is still well-preserved and may serve as a permanent standard from which to estimate the achievement of Greek architects in this field of civic architecture One may comment on the exquisite balance between pure usefulness and the sublimity of applied geometry that was attained in this example In Hellenistic times the action continued to take place on the orchestra, and the scene building formed a permanent background It was only later that the action was 'driven back' to a low stage The reconstruction of the theatre at Priene by von Gerkan shows the general appearance of the complete theatre in Hellenistic times

9 THE HELLENISTIC CITY – PRIENE EXAMINED

"Of all Greek cities which have been excavated the most regular in arrangement, the most typical of Hellenistic ways of city building is the Ionian town of Priene" Thus Professor Gardner[44] describes the town which of all demonstrations of Greek town-planning principles has given rise to most controversy. It may seem bold to talk of 'typical' ways of city building where the manifold factors of topography, economics, climate, must colour the final result of any attempt at predetermined and systematic design But it is characteristic of the wide generalizations and integrated standards of Hellenistic planning that one does instinctively think in terms of typical arrangement or typical effect Actually the finite result of the planning of Priene cannot be equated directly with other Ionian cities, for scale and sequence of entities must always be variables in the whole process

The constant factor that makes the Ionian city recognizable as belonging to a category of cities is the underlying attitude that is reflected in its completion To be significant the variety of plastic effect that is conditioned by variables must be initially controlled by a central aesthetic impulse The idea is not new,

[43] HAIGH 2 works
[a] FLICKINGER, for the development of the theatre
[44] GARDNER (*Trans Town Plann Conf* Ldn 111–22, 1910)

for it is simply the expansion into the field of large-scale public construction of the basic classic concept of controlled design The search for universals in art which is easily assessable in four centuries of Greek sculpture and architecture may be said to have moved from these media into one which was of more moment and offered greater formative influences to the common citizen The cumulative effect of contemplating single examples of sculpture and architecture (cult statues, temples, etc) must have been largely offset by the intermittent and self-conscious nature of such contact, so that we may regard the architecturally unified city as being significant in providing a sustained pattern of environment which must inevitably have raised the index of visual satisfaction to a new and higher level What was gained by the contemplation of single isolated objects now assumes a new order of continuity, there is a fulfilment of the sensory faculties that accords with a collectively growing sensibility

The absorption of sculpture into the wider pattern of city structure for instance, is a progressive process There is a loss of identity and significance in this branch of Greek art that is measurable from the time of the early cult statues through the kouros and kore types (intensely formal and having a 'civic' importance) to the representational productions of the fourth and third centuries B C What had been primarily an abstract and universal statement underwent a steady degeneration into a medium that had neither architectonic significance nor ritualistic justification

When we say, therefore, that Priene is typical of the Hellenistic cities we merely imply that it demonstrates a unifying process in its constituent elements, and that the architectural expression of its institutions has finally crystallized into significant forms The elements have no longer a specialized treatment, there is only one medium -- that of town-planning

The illustration (*Plate* 3) shows the general arrangement and appearance of Priene in the Hellenistic age The site lay on a mountainside and overlooked a broad valley below The city was walled and approached on both east and west sides Running east and west through the town was the main artery off which the secondary circulations served the whole area. The population is estimated to have been about 4000

What have modern critics to say of Priene? Professor Abercrombie considers that "nothing could be more futile than the application of Hippodamian rectangular principles to this site" [45] Fyfe, who quotes this opinion, replies that "as the general

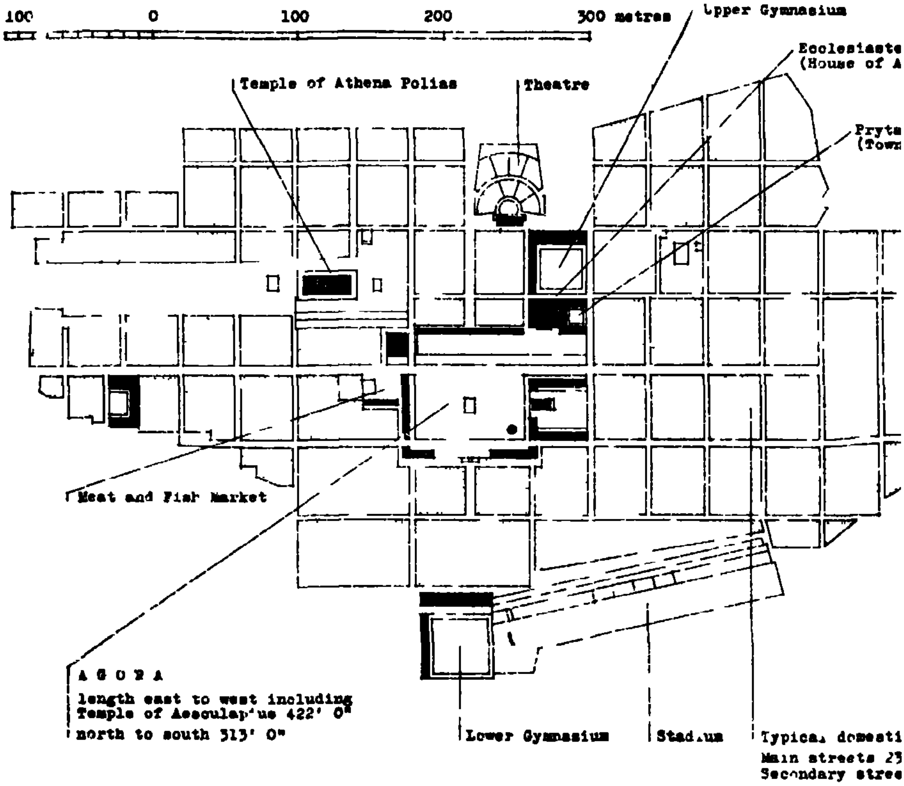


Fig. VII Plan of Priene in Ionia
Based on the excavations of Wiegand and Schrader, 189, 0

slope is steep it should be realized that some kind of terraced system was inevitable, and the creation of a long east-to-west line cutting slightly across the contours and having an upward gradient gradually getting more level in the approach to the Athena Temple from the east gate is very impressive'

[45] FYFE Page 168

Lavedan sees little merit in the general plan of Priene but in turn quotes Bonnet[46] who defends the chessboard plan in this context, and who finds in the resulting asymmetry of a regular pattern applied to an irregular site a satisfactory aesthetic effect Haverfield considers that no striking effects appear to have been attempted despite a reasoned and systematic arrangement [47] Gardner refers to the "almost mathematical precision" with which the streets are laid out, and finds the "extreme uniformity of arrangement" puzzling [48] He quotes Wiegand (the excavator of the town) who sees in the whole complex a unity and nobility of proportion that can be compared with the organization of a great house

Thus in a variety of opinions we see two main standpoints The attitude that seeks picturesqueness, unexpectedness, or irregularity is disappointed Abercrombie, Haverfield, and Lavedan obviously deplore the lack of charm in Priene, but Gardner, though frankly at a loss to appreciate the full significance of the scheme, pays a tribute to the orderliness that he finds there Wiegand with intimate knowledge of the site seems to accept the arrangement without undue comment on aesthetic grounds Bonnet warmly defends it

An objective examination of the materials that gave rise to Hellenistic town-planning must immediately rule out all 'surprise' or disappointment at the form the city structure now takes The attainment of formality at Priene reflects one thing clearly, that piecemeal development and haphazard charm had no place in its make-up The continuity of the city pattern and the emphasis on uniformity are not factors that can be evaluated for or against the success of the city as a whole, they are interwoven in its fabric Without an understanding of this fact we cannot interpret the sum achievement of Hellenistic planning, nor one may add, could we claim to have grasped the significance of the Greek plan in archaic and Periclean times The subjective imposition of standards of 'taste' which have no basic reference to the concepts that made the building of Priene possible must lead to chaos To find that features of interest or 'striking effects' are wanting or that a system is 'futile' without

[46] LAVEDAN Page 154

[47] HAVERFIELD Page 44

[48] GARDNER (*Trans Town Plann Conf* Ldn p 115, 1910)

first establishing the validity of such phrases cannot lead to a true assessment of the scheme

To say that there were no striking effects in Priene is not to offer a criticism This 'featureless' state is an inherent condition of the arrangement to which all the parts subscribe, in other words the uniform texture is of the same order as that which underlies all that we deem characteristically Greek That the pattern of a krater or a kylix lies harmoniously within the surface, that the individual contours of a kouros reinforce the whole effect of the figure, that the progressive stages of a tragedy are significant in their cumulative effect and not in themselves – all these things are not merely incidental, they form the substance that enables us to refer specifically to the Greek spirit, the Greek contribution So also in our city are the accents only indicators of an all-embracing unity, a complete shape

We have in Priene, if not a typical Hellenistic city, then at least an ideal demonstration of an approach to a finite work of art on a large scale The purpose of the architect is difficult to achieve, and though parallels have been suggested above in the completion of a vase or in the carving of a statue, the actual mechanics of city construction are subject to practical restrictions of such magnitude that a finite solution is virtually unattainable Let us scrutinize the arrangement of this town and attempt to find just how near 'perfection' its builders came in its completion

The street pattern immediately impresses by its adherence to the right angle as seen in true plan Where the gradient is too steep for the maintenance of normal circulation, the streets are converted to stairways The main east-to-west street that passes through the north of the agora is clearly visible on model and plan At right angles to this is the principal cross-street which serves the commercial (west) side of the agora, the south gymnasium and stadium, and the precinct of the Temple of Athena Polias On the centre-line of the agora is another street that links agora and theatre, and on the east boundary of the agora is an important street that links the Temple of Asclepios, the Prytaneum, and the northern gymnasium. On occasions that involved a large movement of the population in the region of the 'civic centre' it is quite likely that all three streets were heavily used

The width of the main streets was approximately 23 ft, that of the secondary, 11 ft 6 in Any wheeled traffic would normally be restricted to the main east-west street which connected the public space and market with the city gates Little comment seems called for where the easy relationship between dwelling and public building, and between central meeting place and outlying 'suburbs' is so clearly visible When one bears in mind the kind of movement and occupation of its people and its physical dimensions, the city as a whole begins to form itself in the imagination, and the model helps us to give shape to speculation

The agora has been dealt with in general terms earlier in this section Let us consider its treatment at Priene The agora dominates the whole city, it is boldly proportioned to the needs of the populace, and provides the focal point for civic activities Grouped with it are the public buildings that symbolize for us the nature of Greek collective life In position the agora is virtually central, and in size it measures about one-fifth the length, and one-fifth the breadth of the city Within its area the various statues of the city stood in free groups, and encircling its main area was a continuous stoa, east, south, and west On the west side were shops, and beyond these a small market To the north lay the principal stoa, which extended beyond the limits defined by the other colonnades The only direct link with the circulations of the city are along the main street The brilliant conception of the agora with its defining stoas is nowhere else better exemplified than in this example From a practical standpoint the agora was equivalent to a great open-air hall, available no less for festivals than for the ordinary activities of everyday life

Architecturally it is of the greatest significance, for in combination with its complementary stoas it is the apotheosis of the Greek Doric column system The laborious researches in space definition and the vivid experimentation in expressive technique that are traceable through the whole history of Doric temple building seem to have crystallized in this harmony of controlled and modulated space In the case of the temple the peristyle held within its embrace a building of enclosed and limited function In the stoa the column system retains its purpose as a screen, in that the columns define a visual plane

and yet allow a penetration of space between them, but the defined area of use, the agora, is open to the sky In spite of this apparent reversal of functions the nature of the colonnade has undergone no change but merely an extension of application

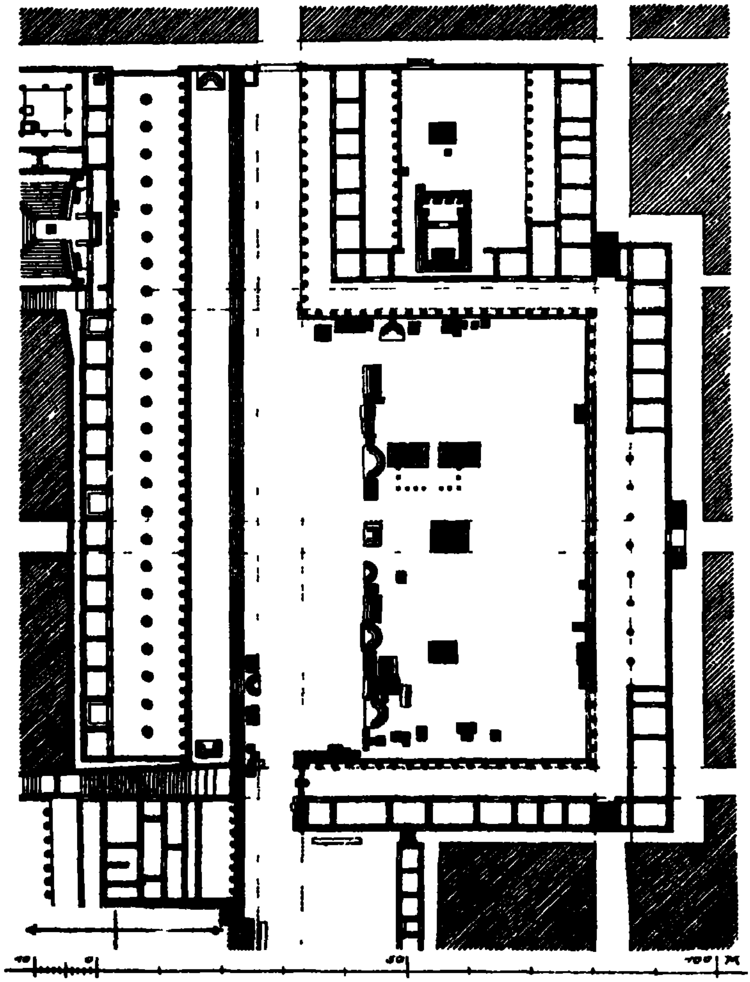


Fig VIII Plan of the Agora at Priene
Von Gerkan *Griechische Stadteanlagen*

The reconstruction drawing of the north-west corner of the agora shows some of the detail of its treatment (*Plate* 5) Here is an architecture that offers the essence of space, a sense of order and dignity in scale with the meaning of a city Man is the measure, but in this lofty Doric colonnade with its sharp mechanistic components he has established not only an architectural standard to match his physical stature, but one that measures the extent of a free intellect that soars beyond the material, and yet can hold and express in tangible form something of its excursions.

The northern limit of the group of civic buildings in Priene is marked by the theatre We have seen in the treatment of the agora a construction of plane surfaces and rectangular definition, in the theatre there is a direct application of fundamental solid geometry to a purpose so exacting in its requirements that we are still astonished by the sheer intellectualism of the feat. The universal and therefore formally recognizable shape of the Greek theatre is in itself an intensely satisfying expression of function In earlier examples the theatre did not always bear a positive relation to other civic elements, but its self-contained 'stability' was always impressive At Epidaurus for instance the great cavea commands a wide view of the Asclepian sanctuary below, and seems to gather the immediate surroundings into its embrace At Priene the theatre, like the temple, now complies with the framework laid down for it, the rough hills no longer brush its edge in sharp demarcation, it too has become urbanized

According to Wiegand[49] there were about eighty blocks or insulae for the inhabitants of Priene As a rule these were divided into four sites for houses of 80 ft × 60 ft, an extent somewhat greater than that occupied by the older houses of Pompeii The houses almost invariably had courtyards, and the arrangement of one example from the north-west region of the city (House XXIII) may be briefly described as representing a characteristic arrangement

The house is approached from a small porch in the south-east corner by means of an extended vestibule, which in turn gives on to an open forecourt. The principal room faces south on to a

[49] WIEGAND and SCHRADER Page 285 ff description and illustrations of the houses

loggia, and the various secondary apartments are grouped on the remaining sides of the court The 'living room' is strongly reminiscent of the megaron of Mycenaean days and seems to have undergone little change during the intervening centuries The court of House xxIII measuring about 30 ft × 30 ft is a minute replica of the agora, and was no doubt treated as such by the occupants The general scheme of this little dwelling offered admirable privacy and security, and within the limits of its area a high degree of architectural interest It shares many basic elements with its more monumental counterparts, the civic and religious buildings According to living standards of the time, and in view of the fact that many leisure hours must have been spent at public gatherings and entertainments the house seems to have been well suited to its purpose At least it is safe to say that in pattern and general architectural treatment it maintained the texture of the city scheme in a manner which is difficult to parallel in other times

We have seen enough to establish that Priene in particular, and the Ionian Hellenistic cities in general, display a degree of classical completeness that is based initially on the integrated and standardized elements of individual structures The final expression of the city is the result of co-ordinating and adjusting these elements to a postulated framework on a town-planning scale The city is not merely an aggregate of units each with a specific purpose, it is a new organism with a new character that arises out of a simultaneous manifestation of unity in all its parts For example the Ecclesiasterion is in itself the product of a succession of definitions of special purpose, its practical demands and structure merge in an architectural unity, but at the same time it bears a positive relationship to the principal element of the city – the agora – which in turn is strategically placed and plastically formed in relation to the whole city Such a progression (which can be similarly shown for other elements) reflects a clear predetermination in the mind of the planner, it can never be the outcome of 'natural' growth Let us consider the agora and stoa at Priene with the special purpose of examining the abstract quality that was achieved in Hellenistic planning A practical function of the stoa is to provide protection It is easy to agree that this must have been achieved by the arrangement

employed, but it is also quite clear that similar (or at least adequate) protection could have been obtained with much less 'architecture', and the question therefore arises What is the nature of this 'plus' quality that we sense in the arrangement, for instance, of the elements in the north stoa? What has been deliberately produced that transcends immediate requirements? A full answer would carry us beyond the scope of this section, but it is important that we record something of this plus factor in the Hellenistic city, and recognize its occurrence as a contributing and conscious part of the whole achievement

We may set down the elements that are visible in the reconstruction drawing

(*a*) The plane surface of the agora accented by statue pedestals this plane being the datum level from which the surrounding structures spring

(*b*) A flight of six steps leading up to a broad terrace before the north stoa This flight is uninterrupted for its full length of 473 ft

(*c*) A terrace sloping slightly upwards, and measuring 21 ft in depth, also uninterrupted for its full length

(*d*) A further flight of three steps leading directly into the stoa

(*e*) The north stoa, 38 ft in depth and fronted by a Doric colonnade of forty-nine columns with an intercolumn measurement of 7 ft 6 in and having a shaft height of 17 ft The pavement level of the stoa is 6 ft above that of the agora

The drawing shows only a corner of the stoa, and although we cannot form a complete idea of the full effect of an unbroken colonnade of over 400 ft in length from this alone, we can, by referring to the plan and model, keep all the elements in mind The practical achievement is the construction of an extended portico commanding from its raised level an uninterrupted view of the agora and its activities The aesthetic achievement lies in the employment of an established notation of architectural forms to produce a background commensurate with the collective nature of the activities to be undertaken within the setting The scale of the construction is thus proportioned to the accentuated and shared demands of the group rather than to the

requirements of the individual, the group spirit is provided with a psychologically expanded background

From the material data listed above we can see how this expanded scale' was achieved The elements are few but significant, the effect is one of serenity and stability The repose in the broad planes of paved surface, the cumulative strength of repeated units, and the measure that these provide are the visual indices of the resultant unity One should not read an isolated significance into each of these elements, they are not 'features' in themselves Only in their balanced synthesis does the essential effect emerge The quantitative analysis has been undertaken only to focus attention on the components

The architect's equipment in the shape of a wide vocabulary of universally recognizable space-structure elements has enabled him to approach an exact solution to a stated problem In the gradual process of selection there has emerged an abstract quality in large scale civic planning, a quality that lies beyond the restrictions and approximations of simple building, and entitles the architecture of this epoch to rank with the brilliant manifestations of Ionian genius in other spheres

III

THE GREEK HOUSE

I THE POSITION IN THE FIFTH CENTURY B C AND THE FINDINGS AT OLYNTHUS

Of all the researches in classical archaeology perhaps those directed towards a reconstitution of the house evoke most strongly the sense of contact with living people In fragments of temples we glimpse collective aspiration, in the theatres an echo of poetry may still linger, but in the tragic intimacy of ruined dwellings a whole world of domestic life is re-created for us The Greek city embodied the inspired geometry of centuries of experiment It gathered into a single demonstration the minutiae which had been weighed and tested in the search for standards The house is one unit in the structure, but its organization reflects the greater complex which enfolded it The city was the measure of the Greek spirit, but the house records for us in tactile form the aspirations of the individual, his mode of life and the dimensions of his physical existence

The Hellenic house has long been relegated to a position of architectural inferiority, but it is reasonable to suppose that men who were capable of working in the exacting medium of the architecture of civic enterprise must have directed at least a degree of conscious effort toward the more immediate problem of the house Short of an almost unbelievable inconsistency of attitude in the lay citizen of Greece, the plastic expression of the house must have echoed the attainments of the architect in the wider field of creative responsibility That such a reflection need not be universal we are only too well aware today, but a filtration of ideals must have taken place in a society for whom civic building was a constant reminder of the possibilities of architectonic form In Periclean Athens the deliberate science of space definition must have had its origin in a developed sensitiveness to form and arrangement It is more probable,

herefore, that the monumental architecture of Greece sprang om an acute perception of the nature and expression of naterial formality in the house, rather than in spite of the estriction of outlook inevitable where immediate architecture non-existent

The basic structure of Athenian society would have harboured major contradiction if we were to accept the idea that the Greek house was a crude affair without aesthetic attributes. Even though we are aware of the significance of the agora, of ne palaestra, and of the temple precinct which testify to the pen-air nature of Greek activities, it is inconceivable that the itizen returning from such public encounters would be content, r rather find it natural, to continue his private life in aesthetic overty It is indeed unlikely that the leisure occupations which nriched life in the Golden Age were set in "bare and unattrac-ve" surroundings.

In attempting a reconstruction of the material aspects of the ast it would be wrong to attribute universality on the strength f isolated occurrences, but in the case of the Greek house surely ne fault lies in the other direction The paucity of evidence in omestic building has led to bold assumptions, and the passion or drawing a complete picture of Greek life has given rise to alpable improbabilities It is difficult to believe that in theatre, terature, sculpture, and painting the Greek genius was match-ss, but that in domestic architecture it achieved nothing The rgument commonly advanced for this inconsistency is that a redominant outdoor life rendered the private house a place for ood and rest and nothing more Perhaps the true explanation of ne apparent contradiction lies in the subsequent history of the ouse The fact that private houses represent individual nterprise means that more perishable materials would be mployed than those used in civic architecture Consequently esistance to the destruction of time was of a lower order, but ne architectural quality could have been (and almost certainly 'as) consonant with the Greek achievement in other fields The nplications of this economic difference, though obvious, have een so often overlooked that a misconception has grown into legend

Some years ago the writer made a short reference[1] to this

MARTIENSSEN (*S Afr archit Rec* 18 163, 1933)

problem, so that the evidence of Olynthus was particularly interesting in this connexion In November 1934 Professor D M Robinson published a brief report which threw a revealing light on the form of the classical town and house [2] His discoveries showed that the Hellenic house had achieved a dignity and aesthetic significance usually attributed only to that of the Hellenistic era In Robinson's words "All our finds date before 348 B C and are Hellenic (before 323 B C), not Hellenistic (after 323 B C) We have broken down the barrier between Hellenic and Hellenistic Many realistic tendencies started in the days of idealism long before the death of Alexander in 323 B C, and many works which seem to date in Hellenistic times we can now place before 348 B C Our Olynthian Hellenic houses fill a lost chapter in the history of domestic architecture The classical Greek houses were not so modest in rooms, arrangements, and furnishings, as is stated in the handbooks ' Robinson illustrates the plan of a large suburban house, the 'Villa of Good Fortune, which yields considerable information The principal rooms lie to the north of a loggia to catch the southern sunlight, and other rooms were adjacent to an open court, "which sometimes had columns on one or more sides and in a few cases an actual peristyle" In these particulars we have a close connexion with the known house types of Delos and Priene, which may be described in precisely similar terms, and which extend over the third and second centuries B C It is interesting to recall Xenophon's remarks (*Memorabilia* viii, 8, 9, 10) on orientation of which these examples are a literal fulfilment The so-called 'Maison de la Colline', one of the Hellenistic houses at Delos, bears a strong resemblance to the Villa of Good Fortune, both in general proportion and arrangement [3] If we are correct in assuming a true peristyle from the remains shown of the Olynthian villa (and the evidence for this appears conclusive), then there is a basic similarity between the two examples which fully justifies Robinson's claim to have broken the barrier between Hellenic and Hellenistic

The idea of luxury in the classical house is substantiated by

[2] *Illus Lond News*, 10 November 1934, page 766

[3] JOHNS 8, Robinson and Graham a specific comparison is made between these two examples

more detailed considerations. The fine mosaics with which the floors of the principal apartments were enriched remain in an excellent state of preservation, and are probably the most important Hellenic mosaics yet discovered The wall treatment, too, indicated a schematic arrangement of colours which invites comparison with later achievements Robinson describes a scheme which is typical of the fully developed style at Olynthus[4] and in view of our intended analysis of the Hellenistic types it may be as well to quote him at this point

"The portico walls are painted in three colours separated from one another by horizontal incised lines At the base of the wall of the north portico is a band of white (0 40 m high) and above this a band of yellow only 0 08 m high, the whole surface of the wall above this seems to have been painted red On the east portico the arrangement is similar except that the narrow band is apparently white, not yellow, and the band at the bottom is black"

The stucco was smooth and of fine quality

The importance of these details can be realized when it is known that Olynthus is the only Greek city of the fifth and fourth centuries B C of which the complete plan is known and in the houses of which mosaics have been found Not only is new light thrown on the domestic life of classical Greece, but the later developments of the Hellenistic era show a continuity and essential relationship with the earlier architecture which could previously be *assumed* but which had not been demonstrated in fact The discoveries at Olynthus show that the plastic consciousness of the Greek citizen extended beyond the planning of his own house to the more distant expression of collective civic building Thus the splendid structures of official architecture shared common and significant attributes with the individual dwelling

2. THE HELLENISTIC HOUSES AT DELOS

(a) The Maison de la Colline Analysed For discussion on the Hellenistic house the richest site is Delos A period of great prosperity[5] during the second century B C. is reflected in the luxurious houses which have been exposed by the excavations of

[4] ROBINSON (*Amer J Archaeol* 36 122, 1932)
[5] TARN Page 102 ff

the French school In general they conform to a standard arrangement, although in detailed disposition the elements are not uniformly related, nor are the plans necessarily rectangular. In particular the Maison de la Colline[6] achieves a fine formality In spite of the lack of space which appears to have conditioned domestic architecture in Delos,[7] there is nothing cramped or deformed in this house. In the minute analysis given by Chamonard[8] we have the material for a complete picture of the surroundings of a prosperous Delian citizen.

The Maison de la Colline occupied an insula in the manner which is familiar to us at Pompeii, although no gardens appear to have been included in the Delian layout The excavation of this example was begun as long ago as 1879, but was abandoned until 1894 when Couve completed the work Fortunately the decorative treatment of walls and floors is capable of reconstruction, although the building appears to have been destroyed by fire A general description of the plan will provide a background for discussion The accommodation is distributed on two floors, a practice which appears to have been almost universal[9] in Hellenistic Delos, and a single peristylar courtyard provides the internal open space, which according to Chamonard, characterizes all the examples of this epoch [10] The upper floor is reached by means of a simple staircase in wood, the dimensions and type of which accord very closely with present-day domestic practice The house is entered from the west through a vestibule which opens directly on to one of the porticoes surrounding the peristyle A main portico or *promenoir* occupies the full width of the house and links the principal rooms which lie along the north side. These latter include the 'living room' and two lesser rooms which have access to one another Immediately south of the vestibule is the kitchen, and

[6] ECOLE 8, Chamonard
[7] LAIDLAW Page 243
[a] BEQUIGNON General plan
[8] ECOLE 8, Chamonard, pages 411–16
[9] An interesting variation of the general type is apparent in the example reported by MEGAW (*J Hellen. Stud* 56 135–58, 1936) He states "In Delos the house on the south slope of Kynthos has been further excavated It rises in three terraces, the lowers containing single rooms and the entrance hall which leads up to the peristyle on the middle terrace, while on the highest level there is a large room with mosaics '
[10] ECOLE 8, Chamonard Vol 2, chap 5

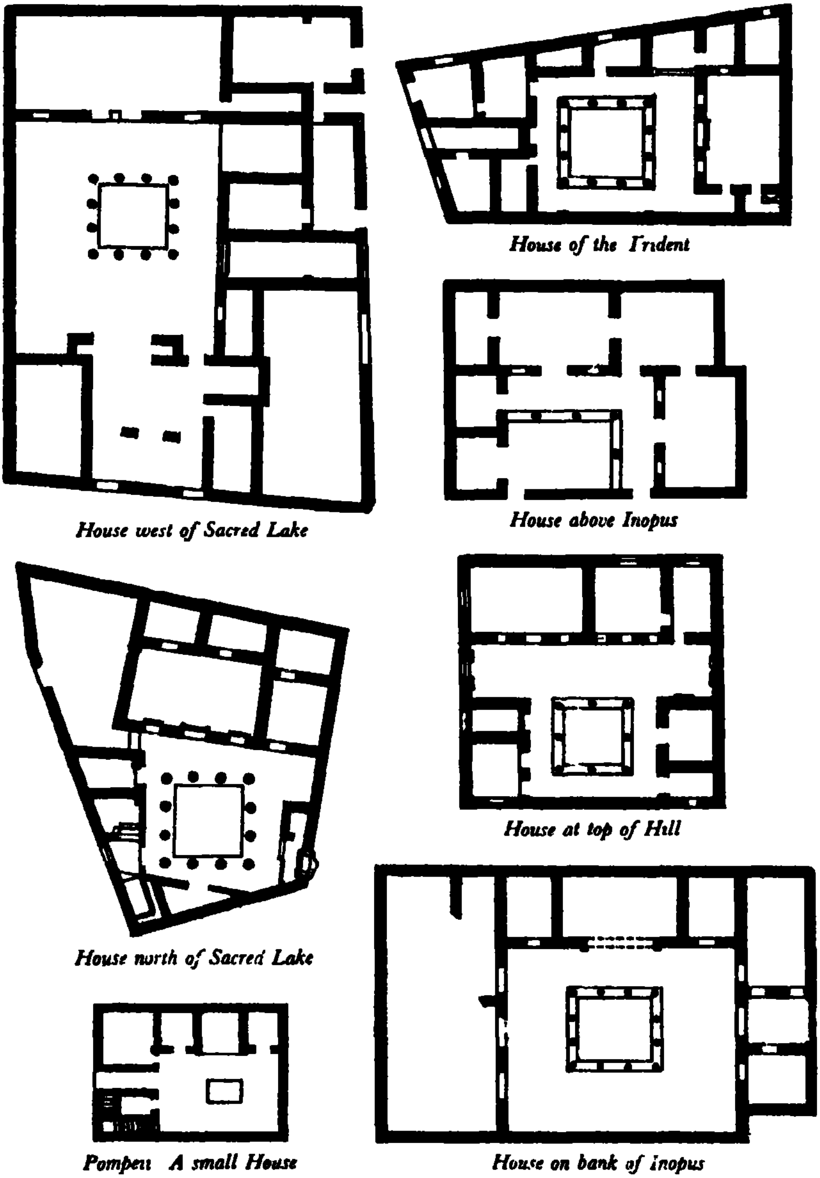


Fig IX The House Plans of Delos
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on the opposite side is a *salon de répose* – perhaps a study or library Although the majority of the rooms had windows facing the street, these were placed high up, an indication that the desire for enclosure and privacy was still present, although the strict turning inwards of the rooms to a peristyle was relaxed

The north rooms are of uniform depth – 5 10 m - but of decreasing length, from west to east they measure respectively 8 15 m, 5 06 m, and 3 08 m The main portico measures 17 50 m in length and 4 75 m in width The vestibule and kitchen on the west and study and staircase on the east are (with minute variations) 3 60 m across, while vestibule and staircase measure 2 00 m in width Kitchen and study are 4 10 m in the same direction A direct transposition of sizes thus exists in these elements The space enclosed by the peristyle measures 4 19 m ×4 45 m, and is bounded by the main portico, by west and east porticoes of width 2 39 m, and by a south portico of width 2 49 m Owing to the relatively small dimensions of the peristyle only three columns are employed on each side, in place of the more usual four From centre to centre these measure 2 41 m on the short side and 2 51 m on the long The columns have a lower diameter of 0 545 m, and for a height of 1 96 m they have polygonal faces which are converted to flutes for the upper portion of the shaft The total height of the columns is 4 08 m and the height from ground floor level to first floor is 4 50 m The overall dimensions of the house constitute an almost exact square, 18 56 m from north to south and 18 89 m from east to west This basic proportion finds a constant echo in the internal treatment

"*La jouissance du plein air, de l'ombre et de la fraîcheur*"[11] which colours Mediterranean life is admirably expressed in the Delian house Benoit criticizes the peristyle plan on practical grounds[12] for, according to him, the opening of living apartments and kitchen on to a common space would involve a confusion of functions One can only surmise that the ritual of dining demanded an immediate connexion between service and dining-room for which the architect had to make provision

[11] BENOIT Page 262
[12] BENOIT Page 263

(*b*) *The Problem of the Roof* The restored section of the Maison de la Colline[13] shows a flat roof with very slight falls It is not easy to make a final statement on the roofing of the Delian house No buildings remained with the first floor in position to provide direct evidence, and the theory advanced by the French school seems reasonable in the light of what does exist It is thought by the excavators that pitched, tiled roofs were used where the plan arrangement was sufficiently organic to make such a type practicable, but that the flat terrace roof must have been resorted to where the variation in shape and size of rooms was such as to render the former type impossible of execution A similar argument has been derived from the evidence accumulated in the excavations of Minoan Crete, and of the pre-Hellenic palace buildings at Tiryns

Myres[14] argues that in the case of the Cretan palaces where "room adjoins room without more than occasional light wells, the roofs (from practical limitations) must have been flat " but that "in the mainland palaces the principal living rooms are separated from other buildings by a narrow, more or less continuous passage This vacant space around the building shows . clearly that a hip roof was employed, and that provision had to be made for the drip from the eaves". In addition Myres refers specifically to the flat-roofed house of the Cyclades, and states that it was "ubiquitous and of great antiquity throughout the comparatively rainless region of the Mediterranean"

The fact remains that roofing tiles were found at Delos, which substantiates at least their partial use In a region where continuity of usage in domestic building technique and arrangement can be constantly demonstrated there is another interpretation of the roof that can be adduced from the Mediterranean vernacular today So far we have two propositions, the true flat roof, and the pitched gable-ended type There is still possible a third intermediate type which is essentially pitched but which does not suffer from the organic restrictions imposed by the inflexible ridge form with its double slope This consists of a single pitched roof (that is, a single sloping rectangle of roofing tiles) which is capable of covering one volume without

[13] ECOLE 8, Chamonard Plate XVIII
[14] MYRES. *Who* Page 273 ff

regard to its height or width in relation to other units This method overcomes the structural and planning difficulties involved in the formal type of roof but retains the common 'tile' character A close parallel to its possible use at Delos is given in numerous examples at Pompeii, where the atrium and peristyle forms invite such an application of single stretches of sloping roof The House of the Vettii (*Plate* 9) in particular shows the single slope admirably adjusted to a type of plan fundamentally complex from the roofing point of view Today, one can see in the region south of Palermo many farmhouses in which the component volumes of the structure are separately roofed in this way with a resultant homogeneity and effect of organization that would have been impossible with the conventionally resolved pitched roof It seems extremely likely that this arrangement was commensurate with the known elements of Delian building

(*c*) *Colour in the Interior* Of particular value are the remains of the interior treatment of the houses of Delos From the results of painstaking work by the French school we are enabled to reconstruct the appearance of many rooms and thus gain an insight into the aesthetic principles underlying the architectural scheme The Maison de la Colline has yielded much evidence of the type and technique of wall treatment employed Vigorous colour was imposed on a basis of plaster, and the areas were arranged on a formal system of architectonics

The treatment of the portico walls consisted of a red plinth surmounted by a high orthostate band in black with white incised channels Above this were three courses again in red but probably of a lighter tone. The niches were treated in blue and framed by white stucco columns The principal room had dark red plinth, black orthostates, and a frieze in green which is subdivided into continuous patterns of repeating elements (egg and dart, meander, etc) In other rooms a white plinth appears to have been used in combination with yellow, red, and black areas above. Thus a deliberate and highly finished scheme of integral colour treatment testifies to the continuity of the Greek tradition of polychromy This continuity which is apparent in the attitude to colour as a factor in architecture from the time of the palace buildings in Crete, through the archaic, classical

and Hellenistic eras is impressive in retrospect Talfourd Ely[15] argues that the inspiration for a fresco on the wall of the oecus of the House of the Vettii (newly discovered at the time he wrote) is traceable to an archetype in Hellenic Athens and not to its more obvious prototype "the voluptuous nude so characteristic of Hellenistic art" We are not concerned at present with figure composition as wall decoration, but this conjecture made at a time soon after the actual excavation of this house carries a parallel interest

In the application of colour to the walls of the Maison de la Colline, and of the House of the Trident, the function is that of an integral extension, not an imposed addition The resultant pattern has more than a material unity with the wall surface which it defines On the other hand, the independent picture creates an illusion on a new scale and of a different order from that of the strictly organized architectural surfaces which contain it[16] The abstract, non-representational significance of the Delian examples gives them a subordinate, but none the less vital, position in the space arrangements which make up the interior ordinance of the house The components of their design may be the development of initially intuitive schemata, but they are in no sense arbitrary In particular the remains in the House of the Trident at Delos are vivid in the information which they disclose (*Plate* 13) The treatment of the walls of the oecus suggests a lucidity of purpose and a degree of development on the abstract plane which accord with the complex systems of space definition of which the house was one expression[17] In spite of the bold juxtaposition of plain colour and richly fretted areas of repeating pattern, there is no distortion in the Delian wall treatment because it is contained within the limits defined by the unity

The introduction of perspective, the enticing vistas and the illusion of naturalism which appeared in the wall scheme at Pompeii are probably not so much a vulgarization of a classic concept as the result of a growing impatience with the material

[15] ELY (*J Hellen Stud* 16 143–57, 1896)

[16] LÉGER (*Archit Forum* February 1939)

[17] Present-day criteria would probably attribute to the egg and dart motif and the fret and anthemion decoration (in this context) a state of 'surrealism' The controlled placidity of the orthostate treatment is comparable with the painting of Mondrian with its rectangular areas of pale colour defined by heavy black lines

restrictions of the domestic scale The use of glass in place of the wall in the twentieth century makes possible a spatial extension to the traditionally established arrangements of enclosure The painted perspectives of Rome and Pompeii attempted this extension in the blind wall, but the attempt was abortive, it was a premature form of Constructivism 2000 years in advance [18]

Chamonard states that the fundamental tones of the Delian scheme are red and black Yellow is only slightly less frequent Colours less vigorous are rare, and degraded tones seldom appear Blue is sometimes employed for joints on white surfaces, but appears to have been reserved mostly for interior surfaces of niches and the upper part of wall surfaces Grey and rose occur on some orthostates and friezes, green is rare [19] One fact emerges clearly from the Delos researches – "*le rouge apparaît toujours*"

This predominance of red is an interesting feature in Mediterranean architecture, and even in Minoan Crete it was a common component in the polychrome treatment of palace interiors Hall suggests that a simple red produced from burnt ochre clay was the first colour to be used in these [20] The decoration took the form of plain lines on the plaster surface Red was soon followed by ochre yellow and black Green and blue were later additions and grey and brown appear in Late Minoan frescoes A deep red eventually came into use, but initially the palette consisted of only light red, yellow, and black

The predominance of positive colours in formal arrangements over such a considerable period suggests that their function was to consolidate and direct the surfaces to which they were applied and not to provide an illusory increase of space [21] With red as the key colour, whether on interior or peristyle wall, there was evolved a basic notation of colour as controlled as the very structural system which carried it

In the case of the Delian house we may recall that blue

[18] LITTLE (*Amer J Archaeol* 39 360–, 1935) A detailed and illustrated analysis of the Decoration of the Hellenistic Peristyle House in South Italy

[a] CARRINGTON Page 138 discussion on the growing tendency at Pompeii (towards the end of the second century B C) to lighten and open the walls, which 'innovations drew their inspiration from the Roman theatre"

[19] ECOLE 8, Chamonard Vol 2, page 386 ff

[20] HALL *Aegean* Page 179

[21] See discussion on polychromy in next section

appears "to have been reserved mostly for the interior surfaces of niches " The niche, an interruption in surface, is treated in a 'spatial' colour which emphasizes its hollowness and the discontinuity of plane Such a change in tone at a point of structural change reinforces the theory that the main purpose of colour was to lend weight to a surface and not distraction

The horizontal planes from which the vertical elements of the house are generated constitute an important factor in the final effect of space As we may expect, the Hellenistic examples at Delos display in floor treatment a feeling of conscious design in keeping with the remainder of the scheme In the House of the Trident there is miraculously preserved a series of mosaic decorations which express to the full the delight and vitality of their medium (*Plate* 12) For the systematic recording of the methods and materials employed by the craftsmen in Delos we must again turn to the findings of the French school The treatment falls under two principal heads geometric (regular patterns with varied colours) and representational (in which figure, marine, and still life motifs are embodied in single compositions, which in turn are framed in rectilinear patterns) Three particularly attractive examples of the latter class were found in position in the House of the Trident They occur on two sides of the peristyle and in the exedra [22]

The design on the floor of the exedra represents a Panathenaic amphora with which is composed a palm and a wreath The peristyle panels show in one case a trident, and in the other an anchor entwined by a dolphin [23]

We know that still life compositions had attained an amazing maturity in the first century B C The wall painting from Pompeii[24] (*Plate* 11) indicates a degree of artistic poise which is the product of advanced technique and instinctive sensibility But the Delian amphora, lightly placed in a shady recess, has the charm and freshness of a primitive The organic limitation of the material checks a too free development of the theme, and

[22] The subsequent excavation of the House of the Masques (*Bull Corresp Hellén* 57 98–160, 1933)

[a] ECOLE 14, Chamonard further examples of mosaic art of fine design and craftsmanship Several are given in colour

[23] ECOLE 8, Chamonard

[a] In colour (*The Archit Rec* January 1929)

[24] BEAZLEY and ASHMOLE

the result, inevitably 'mosaic' in character, accords with the measured forms of the enclosing architecture The trident and anchor designs are no less architectonic in arrangement, but they lack the note of tenderness which informs the amphora composition.

(*d*) *The Significance of the Peristylar Courtyard* The remains of these houses have yielded considerable data. We are now in a position, perhaps, to attempt a general estimate of the achievement at Delos, and consequently to strike an average of the Hellenistic attainment in the domestic field We have already noted the broad arrangement of the accommodation in the Maison de la Colline The House of the Trident embodies the same elements but with some substantial differences in disposition (*Plate* 10) The outer limits of the plan shape include only one right angle, but the internal ordinance is brought to a strictly rectilinear scheme The house is entered on the shortest side through a vestibule, the axis of which coincides with that of the peristyle space, and directly across the impluvium and facing south is placed the oecus

Once again we have a peristylar arrangement in which the main entrance adjoins one of the narrow porticoes, and in which the courtyard has rooms on three sides In the Maison de la Colline we enter and approach the principal room with only an oblique experience of the peristyle, in the House of the Trident the graded approach through vestibule, and across (or around) the peristyle approach, provides a much fuller sensation of the effective space of the house In the first house, though the arrangement is straightforward and practical, the quality of the progression is not of the same order as that of the second, in which the direction has an organic continuity In both instances the system is architectonic, but in the latter context there are greater plastic possibilities

The peristyle has a long tradition in Mediterranean countries In the 'Little Palace'[25] at Knossos there appears to have been a true peristyle between the entrance hall and the megaron – a literal prototype of the arrangement at present under discussion – and Robinson's discoveries at Olynthus substantiate its appearance in Hellenic times The colonnade is a vital

[25] FYFE.

component of the domestic scheme, and its full import in a general sense will be examined when we discuss the arrangement of the temple in its setting

It was suggested in the previous section that the Greek house was one unit in the city structure, and that its organization reflected that greater complex The house is indeed a miniature city In its spacious courtyard, which, like the agora, is an area of free movement and distribution, there is embodied a parallel desire for architectural formality In the slender Doric columns, and in the pattern of mosaic floors we see that impulse towards a plastic harmony which is the touchstone of Greek art

The house represents the cellular organization of a single family unit The agora connects with the city and, through the city, with the outer world But the house looks inward to itself. It is open to sky and sun, but protected from the traffic of its surroundings

The peristyle provides expansion within a restricted space It is a mode of extension to the domestic scale that links the house with the more monumental essays in religious and civic architecture The peristyle of temple and stoa, the broad plane of the agora, find an echo in the partial enclosure of house, portico, and courtyard The Hellenistic house exemplifies a classic ideal There is nothing haphazard in its shape Craftsmanship was merely a means to an end, and where we can find faults they can be attributed to lack of technique or lack of funds, but never to lack of intention The aesthetic conscience of the individual was as disciplined in his private enterprises as in his collective endeavours, and the house reflects an aspect of spatial arrangement no less significant than undertakings on a civic scale

IV

THE DORIC TEMPLE

I ORIGIN AND PURPOSE

The basic prototype of the Doric temple was in essence a simple shrine consisting of a single-roofed cell with a doorway in the east wall, and from this primitive form of enclosure or protection developed the succession of temple types which have been classified by Vitruvius according to their columnar arrangement Before the establishment of this idea of a 'house' as a setting for the plastic symbol of an anthropomorphic concept however, there was in the Mycenaean era an earlier stage at which the focal point of religious ceremony did not take the form of a temple building, but consisted of an open-air altar at which sacrifices were offered This is an important point, because the significance of the altar was never lost sight of even in the fully developed temple complex, and its position and function were defining influences in the design and arrangement of the temple when the altar-temple duality replaced the single element of the sacrificial altar

Linked with the idea of the open-air altar, and in fact providing the *raison d'être* of the temple itself was the Greek attitude to the plastic representation of the gods which had its origin in a strongly anthropomorphic imagination. It is beyond the scope of the present thesis to comment upon the extremely complex problems arising from the whole structure of Greek ritual and belief, but we may broadly assume that the anthropomorphic conception of the gods was a developing process which involved a change from the recognition of the mysterious and implacable forces in nature, to a belief in certain 'definite and personal' gods In other words there was a change from fetishism to polytheism which in turn was positively reflected in the conscious arrangement of sacred places of worship

The worship of sacred stones and trees indicates the belief that

these had some magic properties in themselves, and later it is likely that they came to be regarded as deities The sacredness of certain places traditionally associated with specific gods would tend to localize and concentrate the ritualistic and civic ceremonies to such specific spots The early choric dances in honour of Dionysos for instance, would be held near his sacred precinct, and this fact in combination with a suitable topographical situation would in turn provide the basis for a formally shaped theatre [1]

The earliest chthonic ceremonies, then, were held in the open air, probably in some form of enclosure suggested by the natural conformation of its surroundings or by a clearing in a grove, and such rites as were performed in sacrifice or other demonstration took place before the symbol, external to it and only in an implied (not constructed) enclosure The substitution of an anthropomorphic symbol for a purely natural or non-representational object may be assumed in principle to be the starting point for providing a constructed protection or 'house' for the deity symbol This change-over from a chthonic to an Olympian form of religion thus becomes closely associated with the deliberate creation of a formal architectural framework for the whole procedure of religious ceremony

The protective dwelling for the god afforded no space for the worshippers, and, from the point of view of the perceiving spectator, had an essentially external significance Internally such special treatment as it may have received must have been of a limited type and of a degree considered to have been in accord with the statue – if such were the symbol – to be enshrined Externally, however, the architectural envelope became in turn a symbol of the splendour and greatness of the deity, and in this process was established the particular form of treatment that was destined to play an integral part in temple design throughout the long history of its development For the temple, unlike the dwelling constructed for human habitation, is primarily significant as seen from the outside The dwelling having satisfied the requirements of accommodation and arrangement which are the generators of its plan and volume may (without appreciable lessening of its amenities and practicability) externally offer nothing but an unenhanced

[1] GARDNER *in* Whibley Chap V

envelope Such openings and other attributes as are reflected there are merely the externalization of internally generated functions In a word the dwelling must start from interior arrangement The temple (as we may term the general structure from its beginning as a cell to its final expression) has fundamentally no internal complexity and thus starts from a basis of exterior effect or appearance This is a fundamental proposition, and one which must not be lost sight of in the consideration of the forces that shaped and modified the treatment of the temple during the span of its growth and approach to perfection

Let us remember also that the temple was never at any stage of its development a place of assembly It offered accommodation only sufficient for the purposes of ritual, and no matter what changes took place with regard to size (and great size was achieved in some examples) this attitude was never relaxed nor was its external significance lessened

2 THE DEVELOPED TEMPLE

Perhaps the most important link known to us between the dwelling place built for the gods and that built for man himself in Greek lands is that afforded by the megaron arrangement exemplified in the palace at Tiryns Here we have the pattern of the temple type, and although the domestic complex at Tiryns is hemmed in by other elements leaving only a frontal aspect and an interior importance (which is consonant with our proposition for the emphasis on internal generation of the plan arrangement), the exclusiveness provided by porch and vestibule lent itself admirably to the effort to create a specially enhanced setting for the deity symbol when the time arose for such a construction

The megaron at Tiryns had an ante-room between porch and main room, and although this element is not reflected in the temple until the advent of the peristyle when the pronaos assumed the position of a vestibule or ante-room, the general sequence of elements shows a strong link between megaron and temple In considering the architectural treatment of the megaron we may note that the walls were of sun-dried brick, the inner surfaces of which were stuccoed and frescoed,[a] floors

[a] RODENWALDT Decoration of Tiryns in colour, Plates 3 and 4
[a] BOSSERT Figs 49–52 colour decoration at Tiryns and Mycenae

were of concrete and the columns of the entrance porch in wood It is not absolutely certain what roof type was employed Myres[3] argues the likelihood of a pitched roof with gabled ends, Perrot and Chipiez[4] show a flat roof in their reconstruction At any rate the 'inorganic' building-in of the megaron at sides and back does not foretell the clear-cut and three-dimensional form

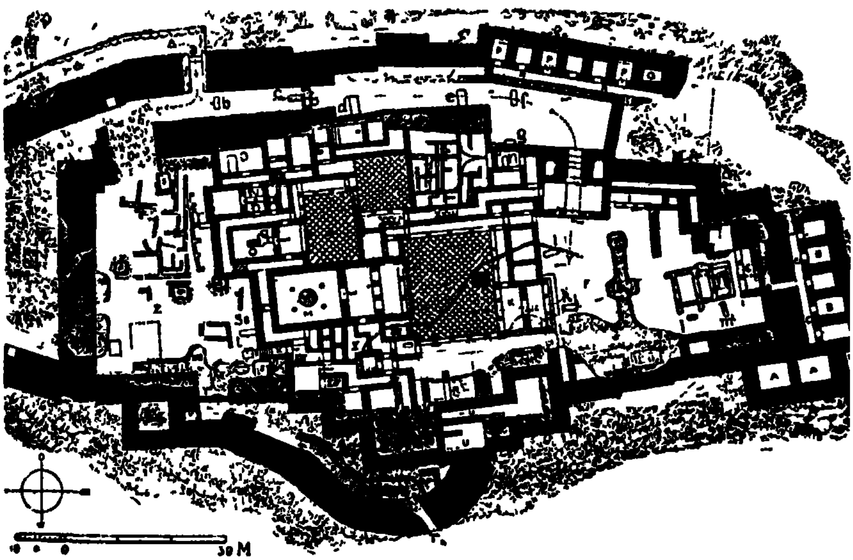


Fig x Plan of the Palace at Tiryns
Robertson *Handbook of Greek and Roman Architecture* – from Rodenwalt *Tiryns*

of the temple as an isolated structure The temple as such was an independent creation and owed only the genesis of its plan to its distant prototypes in Homeric times

The altar in the columned forecourt at Tiryns is worthy of note At this stage of our investigation it may be more fitting to enumerate the clearly established types of temple rather than to trace the occurrence of single examples over a widespread area Robertson[5] does this admirably in his chapter on The Earliest Temples'

[3] MYRES *Who* Page 270 ff
[4] PERROT and CHIPIEZ *History* Vol 2, Fig 298, reconstructed elevation of the megaron at Mycenae
[5] ROBERTSON Page 62

The four general types that must be recorded are as follows

(*a*) The temple in antis, where the side walls of the cella project so as to enclose two columns and thus form a porch

(*b*) The prostyle temple in which four columns at the entrance end form a bold porch, though the latter is now of a more open type Temple 'B' at Selinus was of this type

(*c*) The amphi-prostyle temple in which the prostyle portico is repeated at the back The best known example of this type (though not Doric) is the little temple of Niké Apteros on the Acropolis at Athens

(*d*) The fourth and 'standard' type is the peripteral temple, in which the naos with its porches is completely surrounded by a colonnade or peristyle This is a development and a great advance on the previously enumerated types, and is in fact the type of Doric temple that we shall examine later Within this main classification are many variations two of which may be noted where (*i*) the pronaos and epinaos have columns in antis - such as in the Theseum at Athens, and (*ii*) where these porches are formed by a prostylar arrangement within the main peristyle as in the case of the Parthenon at Athens

The common factor in each of these types is the rectangular naos which remained basically unchanged throughout the history of the temple The introduction of internal columns at a comparatively early stage (as in the so-called Basilica at Paestum) and at a later date (as in the Parthenon) cannot be regarded as an organic modification The Temple of Apollo at Bassae with its ten engaged Ionic columns internally may be regarded as having an exceptional treatment although externally it presented the normal fifth-century Doric ordinance

The temples are further classified according to the number of columns that appear on end elevation, thus the peripteral temples are designated hexastyle, octostyle, etc , according to the system, hexastyle being the common standard (and minimum) for the peristyle type The octostyle arrangement of the Parthenon is a notable exception

The peripteral temple type was not an obvious or immediate outcome of the earlier cellular shrine, nor are we entitled to

assume an unbroken tradition which included the megaron plan of Mycenaean times and the naos complex of the mature temple Such an hypothesis did indeed seem feasible when the Temple of Hera at Olympia[6] was thought to date from 1000–900 B C which would have brought it in range of the megaron influence, but the generally accepted date of *c* 600 B C renders such a direct link untenable. Between the megaron with its columns in antis and the established temple with a similar columnar arrangement there appeared an elementary form of temple such as that at Selinus[7] which in turn seems to have had its basis in a pre-megaron and primitive building type This intermediate temple arrangement had internal columns as additional supporting elements for the roof but no colonnaded pronaos The addition of a peristyle to this simple nucleus is shown in the early (*c* 600 B C) Temple of Apollo at Thermum in Aetolia, where the extremely narrow cella is divided by a central row of columns, and is entered directly without an intermediate pronaos

In this example the cella walls were probably of unburnt brick, the column bases of stone, and the columns themselves with their crowning entablature in wood, with painted terra-cotta metopes introduced between the wooden triglyphs It has been suggested that the introduction of the external peristyle may have been to provide a protective surrounding to the perishable brick walls of the cella, or that it was introduced to overcome structural difficulties arising from the outward thrust on the cella walls from the roof members - but whatever the literal origin may have been, it is important that once this particular arrangement was established it remained as an unchangeable and essential element in the Doric temple Although the purpose may at the outset have been that of expediency, the resulting structure took on, in maturity, an entirely aesthetic or spatially significant aspect

There would be little purpose in arguing whether this spatially defining aspect was in fact appreciated at the genesis of the peripteral type and whether the 'practical' explanation is

[6] ROBERTSON (*Proc Hellen Travellers' Cl* 53–76, 1932) An interesting discussion of the Temple of Hera from historical and technical points of view is given in this paper

[7] ANDERSON SPIERS and DINSMOOR Pages 62–3 for description and illustration of the 'Megaron' at Selinus

adequate to account for a notation that was to become so firmly part of a standard architectural system What we may note at this point is the fact that the wooden columns and entablature and the unburnt brick walls were replaced at the beginning of the sixth century B C by a stone architecture, and in this unifying and formalizing process was born the phase of Doric temple design that was to continue into the fourth century B C

In general terms the peripteral temple consisted of a rectangular cella containing within its volume an arrangement of apartments which varied in size and disposition according to date and situation Surrounding this was the Doric screen of columns which together with its entablature constituted the 'order' The whole was covered by a pitched roof, pedimented at each end, and the structure of cella walls and colonnade was carried on a stone pavement of three steps, the top one of which was known as a stylobate (Where overall dimensions are given of a temple, these will refer to the length and breadth of the stylobate)

Here in essence is the Doric temple, and it must be our task to examine its different manifestations in a manner that always relates to these common characteristics

NOTE The geographical distribution of examples is a wide one, and as we shall have cause to refer to temples not only in Greece itself but in Magna Graecia and Sicily, a list of these temples is appended at the end of this section which provides a general specification of each

With the temple of Hera at Olympia and the Temple of Apollo at Thermum we may assume a starting point towards the end of the seventh century of a great succession of peripteral temples We are not closely concerned with these particular examples, but they are important as representing the point achieved on the mainland of Greece at a time when the great wave of colonization was at its height The foundation of colonial towns in Sicily and Magna Graecia brought about an epoch of temple building in these new centres which, based on models in existence in Greece, transcended these in vigour and splendour, and marked a significant stage in the clarifying and consolidating of standards that so far had been indicated but not fully realized in plastic form. The wooden columns of the Heraion at Olympia were replaced by stone as they rotted, but the process

was one of reparation, a tentative move in the direction of permanence, rather than a fresh construction on a pre-determined plan

We can see this fresh construction in its most vital form in a building such as the Temple 'C' at Selinus (*Plates* 15 *and* 16), product of a fully established technique yet demonstrating a new confidence, a new-found strength in aesthetic expression Is it possible to define this regeneration, if regeneration it can be termed in an occurrence so close in time to the original models? A short description may help us to visualize this building, and in doing so, to establish the pattern of the elements of the Doric temple.

Temple 'C' was situated on the Acropolis of Selinus and adjacent to the main east-west street, although as we have seen in Section II there is a strong possibility that this relation was the outcome of an imposed town plan of considerably later date The Acropolis of Selinus follows a gradual and constant slope for the greater part of its length, and then shelves down to the sea from north to south, but along the main cross street the ground is level from the west as far as the east front of Temple 'C' where it slopes fairly rapidly for some distance down to the sea Thus on the north, west, and south fronts of the temple the approach is level and direct but on the east or principal side the falling ground gives added accent and perspective to the building This is reflected in the additional steps on the east front In comparison with later examples Temple 'C' appears to have been almost casually situated, and bears an intimate relation with the surrounding city which is perhaps unique From the east, however, it must have appeared as a boldly silhouetted and dominating mass On the north-east, too, a great open space lent a valuable horizontal foreground to the temple, and processions and ceremonies must thus have been enacted in a splendid spaciousness

The plan arrangement of Temple 'C' shows an extremely narrow cella isolated from the column screen by a wide pteron The column system - 6 × 17 - represents an extreme proportion that was gradually diminished until in the fourth century B C we find the Temple of Asclepios at Epidaurus having the most compact form achieved, 6 × 11 At Selinus the 'canonical regularity' of the established Doric system is not yet evident,

and the lack of alignment between the side cella walls and the second and fifth columns on end elevation (the normal arrangement in later hexastyle temples) is an archaism that imparts a strongly individual character to the building The lack of a pronaos and the unusual porch effect of the second row of columns on the east front further exhibit a colonial independence of mainland types

Bagenal[8] has drawn attention to peculiarly Sicilian variations in regard to the treatment of triglyph and metope in the Doric temple – the setting back of architrave and triglyph face, for

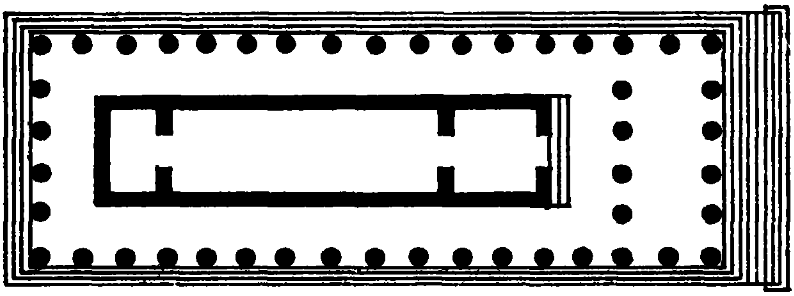


Fig xi Plan of Temple 'C' at Selinus

example, apparently to obviate the excessively heavy effect on the angle view of overhang beyond the upper column diameter which is so noticeable in later mainland temples, and these factors in combination with the points already enumerated indicate the existence of what the same writer terms a 'Sicilian Doric School

Today there is a single row of re-erected columns standing along the north side of the stylobate These redeem something of the original appearance of the temple, and provide at least a measure of its height and length To fill out the picture we have to examine the metopes now housed in the museum at Palermo, and finally perhaps the greatest aid to architects for an understanding of the whole building, Hulot's reconstruction in *Monuments Antiques*

His drawing of the east front (*Plate* 15) catches the special atmosphere of archaic freshness that is still capable of delighting

[8] BAGENAL (*J R. Inst Brit Archit* 43 802–12, 1936)

us whether it is enshrined in the cheerful obscenity of a Black-figure vase painting, in the enigmatic smile and poise of an early sculptured Kouros, or, as in the present instance, where it emerges through a sheer joyousness of new-found plastic power. To whatever detailed analyses we may subject this temple, the fact remains that it is fundamentally the result of a vividly creative impact against the forces of inertia – against the timeless anonymity of durable material. The Greeks who built this temple can be studied through the medium of their other arts, and we must inevitably lose the greater part of its meaning (and our own chance of understanding) if we do not keep the human dimension constantly before us. We are too prone to consider that the dead cities we study were always dead. The ruins that tell of wanton destruction or of the ravages of earthquakes still hold some knowledge for us. Laboriously, men like Koldewey, Puchstein, Wiegand, and Schrader have pieced together the *disjecta membra* so that we can have a picture of their original shape and splendour, but it is only in the mind's eye that we can carry the process a stage further, and see the buildings tenanted. To re-create them thus we must recall their essential Greekness and historical vitality, and bring into focus their material significance.

The east front of Temple 'C' – about 79 ft across – presents a column system of relatively short and rapidly tapering shafts carrying a deep entablature which in turn is surmounted by the polychrome terracotta casings of the pediment. The rich and full curve of the echinus, the sharply modelled outline of abacus, architrave, triglyph, and cornice, and the bold effect of the slender rectilinear volume of naos, cradled within a widespread screen of fluted columns, are all attributes of the archaic spirit. The elements have elasticity and articulation, and are as yet free of 'refining' influences.

The metopes which are still preserved offer a valuable comment on the general mood in which the temple was designed. The strong architectonic scheme on which the figures were arranged, the rigidity and weight, show a sense of unity and continuity of structure impossible of achievement where naturalistic forms are built into an architectural frame. The problem of framing groups of high relief sculpture between the regular and strongly accented triglyphs and the dominant

horizontality of architrave and cornice was an acute one, and the estimate that finds the broad handling of these metopes crude and immature does not take into account the factor that visual interest – that is, independent pictorial quality – had of necessity to be subordinated to the main lines of the enclosing structure Picard[9] rightly allows the archaic Greek sculptor to prefer "*la robustesse à la recherche du detail trop menu*", when his work was part of a larger scheme

Mention must be made at this stage of the application of colour to this temple, although we shall be concerned more appropriately with this factor as a general proposition when we have gathered evidence over a wider range of examples

The rough and uneven surface of the limestone was covered with a layer of stucco which made perfectly smooth surfaces and sharp angles possible (*Plate* 14) This process was invariable and formed the basis for polychrome application In addition such terracotta revetments as were applied to the superstructure of the temple were richly painted in strong colour For the moment we may picture Temple 'C' as having its 'broad brow' boldly coloured in yellow, black, and red – its metopes also in colour, and its triglyphs in blue Other details – taenia, guttae, and antefixae are in red or yellow, and architrave, column shafts, and steps in the self-colour of the stucco That the whole effect was an extremely vivid one there can be little doubt, and although we shall not attempt at present to establish greater exactness in regard to zones of application, colour is such an integral component of the temple that we cannot regard it as a mere appendage

Concerning other temples of the same period in Sicily one need mention only the Temple 'D' at Selinus which adjoined the example we have just discussed, and which dated from 560 B C, and had similar dimensions and columnar arrangement, and the Temple of Apollo at Syracuse built in 575 B C, also 6 × 17 on plan but slightly smaller than the former examples

The parallel example in Magna Graecia is the Temple of Demeter and Kore (commonly known as the Basilica) built about 565 B C at Paestum Here the nonastyle column system obviates any direct comparison Such a drastic departure from the now firmly established hexastyle standard confuses the recognizable integration which is rendered lasting and

[9] PICARD *Manuel* Page 353

significant only by repetition and concentration In detail, however, we may note the same fullness of profile in the echinus of column capitals, the vigorous cuboid form of the abacus The column shafts diminish rapidly as in the Selinus examples - there is the same weight and insistent articulation in the components Whatever indecision may have led to the plan of the Paestum temple there is no doubt that the order itself is by now analytically and categorically established

3 TECHNIQUE AND MATERIAL

It is now necessary to examine the position on the mainland of Greece to see what the succeeding centuries produced either in continuation of the recognized '*ordonnance*' or in modification of it A significant fact that should be recorded at this point is that no major change in building technique is evidenced throughout the period under consideration The Greeks must, at an early stage, have perfected the means of setting out plans, cutting and fitting together the members of stonework, and finishing the visible surfaces of their constructions within close limits of accuracy As far as the mechanical side of building is concerned, no entirely fresh problems presented themselves at later stages The giant Temple of Zeus at Acragas (470 B C) and the great Temple 'GT' at Selinus (of even earlier date) must have offered in sheer practical exertion the greatest test of endurance and ingenuity that the temple builders encountered in their long history

One may reasonably assume that in the field of craftsmanship as opposed to the technique of mass structure, the fifth century saw, particularly on the mainland, a progressive refinement of technical process which must either have followed or influenced the growing refinement of contour and relative proportion that characterized the temples of this century The marbles of Greece must have played a considerable part in modifying detail technique, for where the material is friable and incapable of taking an exact or sustained edge, and the mason knows (as he must have in the examples we have discussed) that a final surface of hard stucco is to be imposed on his work, a certain coarseness, such as we find in rough-core work today, must be inevitable

An examination of the limestone used in the temples of

Acragas or Himera in Sicily, or of the shell conglomerate of the Temple of Zeus at Olympia, indicates that a primary technique suitable to such a material could never meet the needs of the mason dealing with Pentelican or Parian marble. Marble was by no means the universal material for fifth and fourth century temple buildings in Greece and the islands, nevertheless it must have been widely known and mastered by craftsmen, and thus able to influence current technique in masonry.

Let us list the important buildings that were of marble construction

Temple of Apollo, Delos (450 B C)
Parthenon, Athens (447 B C)
Temple of Poseidon, Sunium (425 B C)
Theseum, Athens (428 B C)
Tholos, Delphi (400 B C)[10]
Temple of Athena Alea, Tegea (355 B C)
Tholos, Epidaurus (350 B C)[11]

Contemporary with these, but *not* of marble, were

Temple of Aphaia, Aegina (490 B C)
Temple of Zeus, Olympia (460 B C)[12]
Temple of Apollo, Bassae (420 B C)
Temple of Asclepios, Epidaurus (380 B C)

The most important colonial examples (non-marble) were:

Temple of Poseidon, Paestum (450 B C)
Temple of Concord, Acragas (440 B C)
Temple at Segesta (unfinished) (430 B C)

The position broadly, then, is that there were no marble temples built in the western colonies at any date, and no marble temples in Greece proper before the construction of the Temple of Apollo at Delos, and the Parthenon, about the middle of the fifth century Also, that parallel with the building of marble structures between 450 B C and 350 B C (seven well-known examples) there were constructed non-marble temples on the mainland and in Sicily and Magna Graecia Closer

[10] DEMANGEL and DUCOUX (*Bull Corresp Hellén* 62 370–85, 1938) Illustrated paper on the reconstruction of the Tholos at Delphi

[11] PAUSANIAS Vol 3, page 245 detailed description of the materials employed in the Tholos at Epidaurus

[12] The pediment figures and metopes were of Parian marble

scrutiny of the materials available to the Greek temple builder shows that the predominant and most widely distributed of these was the so-called Poros stone or shell conglomerate, which, with its cavities and roughness, offered an excellent key for plaster (*Plate* 20)

Limestone was the natural building material throughout Magna Graecia and Sicily, and despite local variations the Poros character was common both to Greece and her western colonies Marble was produced from the famous quarries of Hymettos and Pentelicos, and from the islands of Paros and Naxos which gave their names to further varieties

Dickins[13] has some comments on the material of the sculptures of the Acropolis which are interesting from the point of view of character, and also in a descriptive sense Discussing the limestone rock of the Poros sculptures he says "Of varying quality, one block may be full of air-holes or fossilized shells, while another presents the limestone in a pure state . This comparatively soft stone offered much less resistance to the sculptor than marble, and there was no need for the use of saw or drill "

Frazer[14] in his notes on the Temple of Zeus at Olympia refers to the "coarse, gritty, dull-coloured conglomerate to which Pausanias gives the name of *poros*", and quotes Washington[14a] and Philippson[14b] on the subject of what actually can be accepted as Poros

The former remarks

"There is a great lack of definiteness in the use of the word *poros*, which is made to include almost all soft, light-coloured stones, not palpably marble or hard limestone In the majority of cases it is a sort of travertine, again a shell-conglomerate, and occasionally a sandstone or some decomposed rock containing serpentine or other hydrated minerals "

The latter defines Poros as

" a coarse, granular, calcareous sandstone, of a grey or yellowish colour, easily wrought, and quarried in large blocks, much used as building material both in antiquity and at the present day "

[13] DICKINS *Archaic sculpture* Vol 1, page 35.
[14] PAUSANIAS Vol 3, pages 502 3
[14a] loc cit
[14b] loc cit.

We may conclude this brief summary of materials and their properties by noting a few characteristics of Greek marbles, once again quoting Dickins "Naxian marble betrays itself by its coarse crystals, Pentelic is distinguishable by its minute ones "[15] Discussing the premise of two general periods in Attic art (a 'Poros' period extending into the second half of the sixth century, and a succeeding 'Marble' period lasting until 480 B C) Dickins refers to the use in the second period of "the inferior marble of Hymettos, the hard Parian, and the softer coloured Pentelic" [16]

The use of marble for sculpture was thus inaugurated about one hundred years before it was employed in the general construction of temples, and it is noteworthy that in two cases at least (Aphaia Temple, Aegina, Zeus Temple, Olympia) the coming use of marble was heralded by its appearance as the material for pedimental figures and metopes in Poros temples before the middle of the fifth century

The first move away from the attributes commonly associated with archaism in the Doric temple is discernible in the Temple of Aphaia at Aegina, built in 490 B C , and in size considerably smaller than its forerunners Thirty years later the Temple of Zeus at Olympia was begun, and here a greater magnitude was achieved This temple is, in fact, the largest Poros example on the mainland By the mid-century the stage was set for a great effort to surpass all previous buildings, and in the light of garnered experience the building of the Parthenon was begun The Temple of Zeus had been constructed entirely of Poros stone, only the pedimental sculptures and metopes had been carved out of Parian marble, but now a whole temple was to be wrought in Pentelican marble, and all that skill and accumulated technique could offer was directed towards the making of a crowning masterpiece As yet there was little indication what influence the material was capable of exerting in a strictly architectural sense The sculptor had long been familiar with the properties of marble, but the mason, the carpenter, and the architect who had evolved a 'Poros' technique must have been

[15] DICKINS Page 37
[16] DICKINS Pages 10–11
[a] CASSON
[b] PAYNE and YOUNG

keenly conscious of a new force towards refinement - towards even greater precision and finesse than had been thought desirable or even possible with the old method

We may at this stage consider the range of experience possible to the masons employed on the building of Greek temples, as well as the extent of the influence likely to have been imparted to Poros buildings by the contemporaneous erection of marble temples

The temples at Athens, Sunium and Tegea for example, had been completed in marble many years before the building of the Temple of Asclepios at Epidaurus was undertaken, so that in the latter example we have a case of the employment of the coarser material *following* the extended use of the 'refined' material The Temple and Tholos at Epidaurus are particularly interesting in this respect as we have records of the contractors engaged on these buildings, together with the names of their home towns [17]

The inscription discovered near the temple in 1885 gives not only 'full details of the cost of construction' but mentions among the contractors (supply, transport, and executive) men from Corinth, Argos Stymphalia, and Crete Similarly we learn that connected with the building of the Tholos were men from Athens, Paros, Troezen, and Tegea [18] The recruiting of craftsmen from such a wide field implies considerable movement by individuals connected with the building industry, and it is not unreasonable to infer from the information that Epidaurus provides, that local traditions and local conservatism must have taken second place to a broadly valid technique having its bases in a general rather than restricted conception of the problem of temple building.

One of the most obvious conclusions that we must draw is that the masons from Tegea and Athens, for instance (even supposing that this were the only other centre at which they had worked) would be familiar with the appearance of, and the technical methods reflected by, the marble temples in their respective cities, and would therefore be in a position to apply such lessons as the marble technique offered

Briefly, a general distinction can be made between the Poros temples built prior to the middle of the fifth century and

[17] PAUSANIAS Vol 3, pages 240–1
[18] PAUSANIAS Vol 3, page 248

those built after the wide use of marble technique. In the former the stucco was used as a refining agent without knowledge of the appearance of an integral marble structure with its capacity for receiving extremely delicate cutting;[19] in the latter the marble structure existed as a model and a standard to be emulated in a combination of rough core and smooth stucco. Our knowledge of the buildings at Epidaurus (from fragments) indicates that the precept of marble technique induced great refinement in finished effect; the Temple of Asclepios, in fact, seems to have been a building of outstanding harmony and poise when considered as a plastic whole.

It is significant that the *general* masonry technique was fully capable of meeting the added demands of a meticulous finish. The move towards more slender proportions and less articulation in the parts of the temple had obviously made rapid strides in the first half of the fifth century, and it did not require the change-over to a more refined material to render such development possible. That such a stage of development is peculiarly a mainland phase may be due to many causes outside the realm of purely architectural change, but the vigour and genius for imaginative construction that produced the early Sicilian temples on a basis of dim mainland prototypes seem to have passed in a wave back to Greece. It is now Greece that carries forward the search for perfection – the colonies naturally reflect some of this activity, but on the whole the evidence seems to point to a falling back, a 'failure of nerve' as Gilbert Murray might put it.

In this connexion it is instructive to record a single instance of the parallel activities of Magna Graecia. The Temple of Poseidon at Paestum, only a few years older than the Parthenon and built ten years after the Temple of Zeus at Olympia, still carries the general atmosphere of an archaic structure. Dinsmoor, in fact, remarks that the column proportions "might seem at first glance to suggest an earlier date" but attributes the 'heavy proportions' to the great diameter of the columns. "The other details" he adds, "are thoroughly developed."[20] The fact that development (or at least, change) was not uniform in

[19] PICARD *l'Acropole*

[a] FOUGÈRES Large photographs of architectural details of the Acropolis buildings

[20] ANDERSON, SPIERS and DINSMOOR Page 92

the same structure certainly suggests that the main stream of plastic evolution no longer flowed through colonial Greece What had been, a century before, a spirit of bold experimentation seems now to have been replaced by an attitude of careful conservatism. The Poseidon temple indeed shows a closer affinity with the temple of Selinus of 570 B C than with its own contemporary building at Olympia, but as always in archaising art the later example that hesitantly follows an old mould lacks the flamboyant youthfulness, the resilience and freshness of the earlier model

4 STANDARDS AND VARIATIONS IN TEMPLE DESIGN

The fifth century sees the hexastyle arrangement maintained as the standard system, but the lateral column number is still subject to fluctuation The Temple of Aphaia (Aegina) is 6 × 12, the Temple of Poseidon (Paestum) 6 × 14 (*Plate* 18), the Temple of Zeus (Olympia) 6 × 13 The last combination may be taken as the final' fifth-century standard Although this arrangement is shared with other and later mainland temples, and with colonial examples, there is a notable variation in the Temple of Apollo (Bassae) which is planned on a 6 × 15 system The fourth-century temple of Asclepios (Epidaurus) records the limit of compactness achieved, with 6 × 11

It was remarked earlier that the Temple of Aphaia at Aegina marks a break with the archaic condition, and it may be as well to record what changes are noticeable in plan and general arrangement in this transitional example Dinsmoor[21] considers this example "the most perfectly developed of the late archaic temples in European Hellas", and with its strong polychromy and disciplined marble sculptures there is little doubt that it represents a key point in the progressive refinement which the new century was destined to display Plastically the Aphaia temple exhibits a new compactness, not only of overall proportion but also in the relationship of structural minutiae From an architectonic point of view there is a corresponding precision in the arrangement of plan forms that distinguishes the building clearly from the group that includes the archaic Temple 'C' The deliberate alignment of cella walls with peristyle columns, and the resulting change in reciprocal value between cella and

[21] ANDERSON, SPIERS, and DINSMOOR Page 88

pteron (both on plan and in volume) have more than an incidental significance

Where one could attribute to the archaic temple a quality of bold articulation, it is now necessary to recognize that the predominant note of the transitional type, far from reflecting a basic separateness of elements brought together in a plastic unity, actually echoes the postulate of a primary unity to which the constituent parts subscribe in a maintained subordination

In general, in a newly established building type the process of shaping and constructing inevitably throws a strong light on the individual parts Each element holds the stage in terms of its own specific attributes, each carries with it a special series of problems both aesthetic and practical, and it is axiomatic that the visual and manual emphasis that it receives at every stage of the formulating and constructing process will be clearly reflected in the final synthesis The articulation that occurs in the archaic temple with the accent on structural adequacy is fundamentally the reason that such a building appears crude to the spectator today The sense of achievement, of creating a new order of space structure, is too patent and too self-conscious to be accepted as a definitive statement The gradual dissolution of that self-consciousness coupled with the increasing complexity of the temple surroundings (in which there was a tendency for the temple itself to become in turn a contributory unit and not an isolated self-contained structure) expedited the new plastic unity that we have seen demonstrated in the Temple of Aphaia

The most obvious gain from structural confidence and from deliberate subordination of individual emphasis is one of visual continuity in the structure as a whole, of easily apprehended rhythm between void and solid, and of the reduction of effort in establishing for the spectator the singleness of the conception. The offsetting disadvantage, which under some conditions can be a serious one, is the loss of modulation in plastic effect, and consequently the failure to stimulate the vision For whatever advantages may accrue from merging different functions in common forms, this usually involves a corresponding loss of identity in the structurally significant elements Such a proposition cannot be given a finite evaluation, nor is it possible to offer a scale against which the developing temple can be

measured, but the tendency to surface unity if isolated from compensating factors is a devitalizing one and contains the germ of decadence [22]

Perhaps the present point is the most appropriate at which to examine variations of the standard type, departures from established columnar notations, and modifications other than those arising from gradual change in detail technique or refinement

The Aphaia temple dates from 490 B C, and the next great temple in Greece – that of Zeus at Olympia – which followed thirty years after, marks no organic change but only a substantial increase in size Specified in a notational manner it indicates a continuance of the 'new' standard There is every indication that the hexastyle system is in no risk of being abandoned either in Greece or the colonies, but in 447 B C with the construction of a new Parthenon at Athens, the drastic decision to employ an octostyle treatment is made Speculation on the reasons for such a decision cannot be very fruitful, but one may be forgiven for wondering why a system that had been maintained for nearly two centuries was suddenly overthrown The most obvious conclusion is that the sheer intellectualism and discipline that had produced a type which eschewed the temptation of change for the sake of change, had, under the stress of culminating political power, been forced to make of the new temple something more than another building in the succession of temples to the gods The Parthenon had to exceed its forerunners in splendour and complexity (not necessarily in size, for the fever of megalomania cannot be said to have touched Athens) but the reconstruction programme of the Acropolis was symbolic of wider spheres of activity, of greater civic aspirations, and the Athena Temple thus became the focal point of a new order In this violence of civic creation the old Delphic maxim appears to have faded 'Nothing too much' had always been the code of temple building, but in the effort towards grandeur too much was attempted and although everything that was essentially Doric was infused into the structure, the departure – the overweening turning

[22] Actually the incipient decadence finally 'matured' in Rome, where the pseudo-peripteral temple (that is the temple *apparently* surrounded by columns) marked the close of the long march of cella wall towards peristyle screen and wall merging in a mutual loss of identity and meaning

aside from the perfect mean – brought only overstatement and relapse

Whatever the reason for the decision, it was an unfortunate one, and the continuing history of the Doric temple shows no repetition of the experiment In close succession came the Theseum at Athens, the temples at Sunium, Bassae, and Epidaurus, but in no instance did the architect depart from the hexastyle standard – the standard of 'nothing too much' The plastic loss caused by the 8 × 17 arrangement of the Parthenon was twofold In the matter of articulation the addition of two columns to the short side of the temple brings about a corresponding decrease in the visible separateness of these elements – a blurring and continuity This is a state that may be desirable in other contexts, but in the case of the Doric temple it raises the index of subordination to too high a level The second factor is the apparent extension given to the short side The use of eight columns diffuses the sensible difference between an easily apprehended short side of six columns, and the less obvious but considerably greater number of columns on the long side The loss in this respect is a directional one and although in actual dimensions the octostyle temple may be in length more than twice its width (as the Parthenon was) on the human scale there must be a tendency to render the spectator unaware of the sharp distinction between short and long side Once again the question of visual separation is closely connected with the establishment of individual identity

5 THE PROPORTIONS OF THE PERISTYLE AND THE SIGNIFICANCE OF THE CREPIDOMA

The archaic Doric temple was characterized by a peristyle of relatively short, and rapidly diminishing columns, carrying a deep entablature (*Plate* 19) In comparison with the lower diameter of the columns the intercolumniation was small, and the great overhang of abacus and echinus brought each set of these elements into close proximity with those on either side According to Durm's drawing of the Apollo temple at Syracuse the intercolumniation in this example varies from $\frac{3}{5}$ lower diameter to $1\frac{1}{3}$ lower diameter, while the abacus is separated from those on either side by a distance which ranges from $\frac{1}{3}$ to $\frac{2}{3}$

lower diameter. The depth of the entablature is ½ the total column height. In the case of Temple 'C' at Selinus the intercolumniation measures 1½ lower diameter, the column height approximately 4⅔ lower diameters, and the entablature just over ½ column height. In this example the spread of the abacus is close on 1¼ lower diameter, and the inter-abacus space slightly less than this dimension.

The ratio of entablature to column height of 1 : 2 in archaic work was progressively diminished, until by the early fourth century B.C. we find a ratio of 1 : 3 with a corresponding increase of slenderness in the columns to a general ratio of diameter to height of 1 : 6. In combination with a tendency to greater regularity in intercolumnar spacing, and the narrower pteron, this brought about a marked change in the distribution of the structural mass as well as presenting a virtually new relationship of visible surfaces.[23]

The rigidly prismatic form of the Doric temple, and its overall compactness, render its direct relationship to site and the mode of such transition an extremely important factor in the design as a whole. In this connexion an examination of the crepidoma treatment as a basic element between the existing irregularity of the site and the finished horizontality of the superstructure shows an adherence to general type, but modification in proportion during the development of the temple from early to post Periclean times. The main substructure (stereobate) showed above ground level a stepped outer edge (crepidoma) beyond the peristyle, and uniformly surrounding the temple. The top step was known as the stylobate. In general the crepidoma consisted of three steps, and these, in the sixth century, appear to have been proportioned to serve in addition the purpose of ordinary steps up to the temple. This practical aspect, however, was subsequently abandoned in the necessity of proportioning the crepidoma to the height of the temple itself, and in giving added force to the horizontal lines of the substructure. Thus the stylobate in the fifth century was a considerable height above surrounding ground level (*Plate* 17), and approach was provided by the introduction of intermediate

[23] Comparative analysis of measured drawings of archaic and late Doric temples shows the nature of this redistribution of mass.

steps proportioned to the human scale A modification of the three-stepped crepidoma can be seen in the case of Temple 'C' at Selinus where the rapid sloping of the site necessitated additional steps at the east end of the temple, the remainder of the crepidoma had the usual number of steps

During the fifth and fourth centuries secondary steps were not always employed to compensate for the increased height of crepidoma In the Temple of Zeus at Olympia, in the Temple of Aphaia at Aegina, in the Temple of Asclepios and in the Tholos at Epidaurus, the main entrance was approached by a ramp, an element of great interest since its form does not reflect the rectangular quality of the substructure but provides by its gradually sloping plane an intimate and almost imperceptible transition between ground level and temple level

The visitor to the temple remains of Greece today must be keenly aware of the importance of the temple platform, because where all else has been destroyed this element remains to give us the configuration of the plan and its essential relation to the site At such sites as Himera and Selinus in Sicily, and at Delphi and Olympia, where destruction is almost complete, the steadfast formality of the temple base recalls for us the vigorous stereometry of the temple forms Where the temple stands clear of its surroundings such as on the Acropolis at Athens or on the rocky spine at Acragas, one is even more acutely conscious of the bold measure of the great steps as they cut in perspective across the undulating lines of the embracing countryside The form of the structure provides a frame to the landscape - though relatively small and isolated, the Doric temple demands homage of its surroundings

6 POLYCHROMY

In the foregoing analyses we have examined the temple only in its isolated and self-contained form It will be our subsequent task to review the greater unity of the temple within its constructed surroundings - as part of its corporate enclosure, but before we move to that consideration there is one general factor that has a bearing on the spatial characteristics of the Doric temple and which must occupy our attention at this point, polychromy

The study of polychromy in Doric architecture presents many

difficulties, since literary references are scanty and the possibility of colour remaining on architectural members through centuries of exposure and destruction is a remote one. Occasionally the colour application has amazing longevity, and sufficient traces remain for direct observation. At other times, as in the Temple at Himera, excavation revealed colour that rapidly disappeared in contact with the atmosphere – but here fortunately modern archaeology was equipped to record immediately and save for us the knowledge if not the actuality of its findings. Not all the colour disappeared at Himera, however, because even in 1938 clear remains of red were still visible on fragments of the entablature when the writer visited the site. The section of entablature from Temple 'B' at Selinus, now in the Palermo Museum, is a most valuable demonstration of colour usage, and in Athens we may gain some idea of the polychrome range of the Greeks from the vivid colours of the Archaic sculpture in the Acropolis Museum.

As far as the archaic temples of Sicily are concerned we may note that:

(*a*) The Temple 'B' entablature referred to above had taenia in red ochre, triglyphs ultramarine, grooves indigo, guttae and sima white, and an ochre wash on the main field.

(*b*) The colours recorded by Carta at Himera in 1931 are ultramarine and red ochre.

(*c*) The background of the Perseus and Gorgon metope from Temple 'C' shows traces of red.

For later times the evidence of Athens, Delphi, and Olympia points to an extensive use of polychromy in architecture and sculpture. One of the problems that has been debated is whether the Greeks applied colour to major surfaces such as those of column or architrave. Penrose believed that the marble of the Parthenon was treated in flat colour to lessen the glare. D'Ooge[24] recalls the opinion of Dörpfeld who considered "that the custom ... was to leave plain surfaces of marble buildings untinted in distinction from those built of poros ... and also in contrast with other ... parts of the architecture which, even where their material was marble, were treated with color".

[24] D'OOGE. Page 169.

D'Ooge summarizes the position as follows

"All are agreed that the architectural members that project from the plain surfaces, and those that are in profile, such as mouldings, cornices, triglyphs, mutules, soffits, and the capitals of antae, are as a rule colored, and so also those flat surfaces, like the tympana of the gables, that form the background of sculpture"

The evidence of the Parthenon led Penrose and Fenger to arrive at the following conclusions[25]

Triglyphs blue
Background of metopes possibly red
Edges and soffits of mutules red
Guttae probably red
Soffit of cornice blue
Coffers of peristyle ceilings (*e g* Propylaea) gold and blue planes of colour separated by white or gilded fillets

On the Athenian Propylaea we may note that the colouring appears to have been more 'subdued' than that of the Parthenon Magne[26] in his monograph on the Parthenon states his belief that colour had never been applied to column or architrave in that building He confirms from observation the application of colour as listed above Robertson[27] notes that in addition to the widely used red and blue, Doric architecture employed green, yellow, black, brown, and gold "chiefly for the delicate patterns of cornice and sima mouldings"

The remains at Olympia render valuable detailed evidence, and in addition to that recorded above in connexion with archaic colour treatment we have in the Temple of Zeus and in the Hellanodikeon further confirmation of generalized schemata in Doric architecture In the temple red was found between the mutules, while mutules and triglyphs were blue The ground of the sima was light blue From the Hellanodikeon we learn 'that the shafts of the columns, the echinus, and abacus of the capitals, were not decorated with painted patterns, though possibly tinted with yellow or some light colour The cornice . was painted with a band of bright blue leaves and red spines on

[25] D'OOGE Page 170
[26] MAGNE Pages 93-4
[27] ROBERTSON Page 50

a yellow ground The mutules were very dark blue, the spaces between them red The triglyphs were also dark blue, the metopes being merely coated with white stucco [28] The terra-cotta sima had brightly painted patterns on a black ground "

At Delphi the chief evidence is given by the relief sculptures from the Siphnian and Sicyonian treasuries, and in this connexion Poulsen[29] describes the sculptured frieze of the former building as having a background of blue

"The figures are treated in blue, green, and red, the last colour in two shades, light red and golden-red The clothes are red with blue borders the helmets are blue, with red ornamental stripes on the edges, to pick them out from the blue background "

Poulsen describes a metope in the Sicyonian treasury as having the background uncoloured, that is, in the natural white or yellow hue of the stone This is an interesting parallel to vase painting of the sixth century, for "highly polychrome figures, with prominent black and dark red colours, stand out from the neutral lighter surface of the limestone, as the figures of black-figured vases with white and red detail are silhouetted against the natural yellow or yellowish-red ground of the clay" Later, as in red figure vase painting, "light or red figures are set off against a dark background"

In the field of polychrome application to free-standing sculpture we must turn to the archaic examples in the Acropolis Museum at Athens Dickins[30] provides a valuable summary of the colours and painting technique as applied to the Poros figures

"Two shades of red, dark blue, green, black and white tints were used, and the entire surface of the statue was covered, except where the natural colour might be used in contrast The backgrounds are usually blue, but are sometimes left plain the flesh rose, eyelids and brows black, pupils black, red or blue hair blue, red or white, and the garment entirely covered with various hues "

For marble statues, too, red and blue predominate, but other colours are also found, including black, rose, light blue, light green, and yellow ochre "It is hardly necessary to add", states

[28] GARDNER Page 277
[29] POULSEN Page 141
[30] DICKINS Page 36

Dickins, "that the use of colour is still conventional. The whole theory underlying the ancient painting of sculpture rests on the assumption that *the colour is not naturalistic*, but chosen primarily with a view to harmony in the whole colour scheme." (Italics not in the original.)

We have from this activity which is closely allied to architecture data that substantiates the view that colour played a vital part in the creation of significant form in Greece. The conventional aspect which Dickins stresses (and which indeed is most clearly proclaimed by the colours themselves) is a valid indication of the integral nature of colour and form. Because the vividness and primary quality of Greek colour are startling to our eyes, or more exactly to the eyes of the late nineteenth century, the view has often been expressed[31] that the Greek sense of colour was poorly developed compared with the superb appreciation of form and formal relationships that the Greek sculptor and architect displayed. Is it not more likely that the Greeks showed a stronger and more widely embracing attitude towards visual unity than we who have come upon their work in a fragmentary state can ever fully apprehend?

One may well ask why 'the bright intellectualism' that Gardner finds enshrined in the Greek temple should break down so completely when the final dimension to plastic creation was envisaged as colour. When Gardner suggests that the Greeks, though masters of form, were not sensitive to colour he imposes a prejudice on work that united processes (shaping of solid form, colouring of solid form) which we now separate in terms of the visual experience and intellectual attitude that have been built up in the past twenty centuries. One of the reasons for the prejudice is that our attitude to material tends to be sentimental; the Greek regarded his Parian or Pentelican marble as valuable for its purpose, there is every indication that intrinsically it had no charm for him, but to succeeding cultures the marble took on a beauty of its own, and any idea of applied colour was therefore repugnant. Greek 'taste' is thus questioned on this point, and must be either censured or condoned. That marble, as such, did not appeal to the Greeks is evidenced by the fact that they left untouched rich seams of coloured stone which was subsequently used by the Romans. Even where visual

[31] GARDNER. Pages 47–8.

requirements did not demand colour application the marble was toned down by a waxing process to dull its brightness [32]

In general the evidence shows a controlled and formal use of colour in architecture, and in the matter-of-fact summary of Choisy[33] we see the same degree of standardization that characterizes the juxtaposition and interrelation of capital to shaft – of triglyph to metope "*Les couleurs de l'epoque archaique*", he writes, "*sont, pour les grandes surfaces, le blanc, l'ocre clair, le rouge et le bleu, pour les details, le vert, le bleu, le jaune franc et le noir*"

The results of our enquiry may be tabulated in condensed form, for there is sufficient widely separated evidence to establish the general use of the following colours

(*a*) Pale yellow or other light colour, or waxing process to reduce glare, for column shafts and architraves The former for Poros which was stuccoed, the latter for marble

(*b*) Blue for triglyphs, sometimes with a darker shade of blue in the grooves.

(*c*) Red for edges and soffits of mutules, with spaces between, blue, or blue mutules with red space

(*d*) White, bright blue or blue for the sima

(*e*) Dark red or dark blue for the surface of the tympanum

(*f*) Self-colour, dark blue, or dark red, for the background of metopes and friezes

(*g*) Green yellow, black, brown, and gold for secondary elements of the cornice

NOTE The vigorous red and black on yellow ground of the terra-cotta cornices of the Geloan treasury at Olympia and of Temple C at Selinus, with their strong affinity to vase firing and painting technique do not appear to have continued as a colour combination in the stucco on Poros treatment and late marble constructions.

Our examination of colour as applied to the Greek house

[32] DICKINS. Page 40

[a] With reference to Greeks not using coloured marbles BAGENAL (*J R Inst Brit Archit* 40 757 - 76, 1933) "They mined beneath them for the white Pentelic"

[33] CHOISY Vol 1, page 296

showed a predominantly planar and interior use, let us now consider in some detail the use of colour in the context of the Doric temple

Strong colour as applied to the temple covered a relatively small proportion of the frontal area of the structure, and in the portion so treated no single colour was used over a large area We have seen that the pale tints on columns and architraves did not fundamentally change the tones of the material to which they were applied (stuccoed Poros or Marble) and we can reasonably assume that the vertical surfaces of crepidoma were finished uniformly with columns and architraves Externally, therefore, the temple presented a virtually uniform tone from its base to the upper edge of the architrave which was only modulated by the shadows in the column flutes and by the shaded wall surface of the cella behind the column screen

At frieze level the rhythmic alternation of modelled forms is heavily accentuated by bold colour and above this further colour enriches the cornice On the short sides of the temple the vertical plane of the tympanum with its deep colour serves as a background for coloured free-standing sculptures The effect is of vigorous modulation and animated repetition of a 'quicker' order than that of the separate and clear-standing supporting columns which carry this superstructure

The repetition of forms induces visually an effect equivalent to that of resonance in sound, and the application of colour strengthens this attribute For example the deeply recessed triglyphs, though considered by some to be important in carrying the verticality of column shaft upwards, serve what is perhaps a more urgent optical function by providing a 'chain' of stability in a horizontal direction. For though vertical in effect if considered as individual units, it is by their repetition that they are significant in the frieze The 'working' member of this supported construction is the architrave which through its own strength carries from column to column It is noteworthy that this member appears to have been left virtually unaccentuated, while in the frieze above (which was comparatively free of structural duty) a deliberate scheme of optical effects was arranged

Had this treatment been merely decorative, that is, in the form of a continuous frieze without structural division or accent,

the final resolution of the order – the carrying of cornice, etc – though feasible in a practical sense (the actual stonework of the frieze would be substantially the same as it is in the metope-triglyph system) would have been visually weak and unsatisfactory The lack of formality which would have resulted from an intermediate and continuous surface 'swimming' between architrave and cornice would have been inconsistent with the studied architectonics of the Doric scheme From a visual point of view the triglyphs are satisfactory in that they support the members above, while they rigorously restrict the areas of non-structural sculpture within controlled areas The essentially rhythmical nature of the whole structure, established in the peristyle system of columns, is maintained in a minor, though not weaker, scale

Colour as an added 'dimension' consequently plays an extremely valuable role The architect has achieved by formal plastic means the degree of accent separation and structure that he deems necessary for aesthetic unity, what light is capable of affecting as modeller he has used as a constituent in his design But the uniformity of the material with its continuous tone tends to merge the individual forms even if rhythmically arranged, and modulated in plane, so that only in strong sunlight or under favourable conditions of aspect can the full intention of his scheme be realized Colour as applied to the elements of Doric architecture thus has primarily an extending function in rendering this modulation independent of transient light conditions Even when the light is thin, forms that are strongly coloured and separated by complementary colours between become immediately apprehensible by the spectator Colour provides additional freedom and articulation to the shapes that the sculptor and architect have been at pains to express as sharp and distinct within the limits of material technique and unity

Hence one colour is never continued over the surfaces of differing units, but each *similar* unit bears a common colour Red mutules are separated by blue areas, blue triglyphs are separated by the polychrome pattern of metopes Even within the area of the blue triglyph, as we have seen, there is sometimes a further modulation given by the use of dark blue in the channels where the form naturally suggests shade

7 OPTICAL REFINEMENTS IN THE FIFTH CENTURY B C

It has been suggested above that the architect of the Doric temple achieved the degree of accent, separation, and structure that he considered necessary for aesthetic unity within the restrictions of practical technique Let us now examine some of the factors involved in the design of a temple at a time when the architect with the accumulated experience of centuries is richly equipped to meet the problems attendant upon the production of spatial harmony and unity

On the Parthenon was lavished all that Periclean Athens could command in the way of designing talent, craftsmanship, and material In this single building, by common consent the crowning achievement of Doric effort, we are able through the many studies that have been undertaken to probe the minutest details and gain an insight into the resources that went to its making

The Parthenon measured on the stylobate 101 ft 4 in. by 228 ft 2 in., and was carried on three steps, the two lowest of which were 1 69 ft and the upper 1 81 ft in height The columns measure 34 22 ft in height, and have a lower diameter of 6 23 ft The intercolumniation is 7 87 ft at sides and ends, but less at the angles of the peristyle The end width of the pteron is 15 ft, and at the sides it measures 13 ft 11 in

The intention of the architect that the forms of the building "be adapted to the eye of the spectator"[34] broadly explains the modifications from parallelism and rectilinearity that were observed by Cockerell in the Parthenon in 1810, and which were measured by Penrose in 1846 The changes from the basically established shapes of the Doric temple may be summarized as

(*a*) A slight upward curvature of the stylobate and entablature

(*b*) A slight inward inclination of the column axes.

(*c*) An entasis or swelling in the diminishing columns

(*d*) A slightly increased diameter for the angle columns of the peristyle

[34] ANDERSON, SPIERS, and DINSMOOR Page 119.

(*e*) A deviation from the vertical in surfaces such as that of the architrave

All these refinements entailed, according to Dinsmoor[35] "a mathematical precision in the setting out of the work and in its execution which would have been impossible in any other material than the Pentelic marble with which it was built"

Following the order of the list above we may consider these points in more detail

(*a*) *Curvature of stylobate and entablature* Penrose was of the opinion that the curvature was initially formed in the entablature to counteract a sagging effect arising from the sloping form of the pediment, and that to maintain uniformity in the column height the stylobate followed the line thus established Vitruvius[36] states that "the stylobate should be so adjusted, that it may be highest in the middle For if it be set out level, it will have the appearance of having sunk in the middle " Dinsmoor considers it likely that the Greek architect started, as Vitruvius implies, with the stylobate and adjusted the superstructure afterwards to comply, rather than by the reverse procedure suggested by Penrose

The rise of the stylobate in the middle of the short sides was 3 0 in , and on the long sides just over 4 0 in D'Ooge[37] comments on the optical illusion by which a long horizontal straight line with a number of vertical lines resting upon it appears to sink in the middle and rise towards the ends There seems little doubt that such curvature as was included was intended to give elasticity to the structure, and to prevent the 'deadness' that might have been a by-product of the rigidly geometrical and complex arrangement of steps columns, and entablature

(*b*) *Inclination of columns* The inclination of the peristyle columns to aid the visual stability of the building, or to provide a so-called pyramidal effect, called for minute adjustments in the structure The angle columns, for instance, which were inclined inwards on the bisecting line of the angle between long and short sides, rested on a stylobate that sloped in two directions and at two rates of slope The intermediate joints of the column

[35] ANDERSON, SPIERS, and DINSMOOR Pages 119–20
[36] VITRUVIUS POLLIC Page 73
[37] D OOGE Page 118

drums were maintained horizontal, while the upper surface of the abacus had to follow the curving soffit of the architrave. This column inclination (about 7 cm in the whole height of the column, and slightly more in the angle columns) has the effect of preventing an outward falling appearance which the individual diminution of the shafts may be insufficient to counteract.

Reference to the characteristic archaic column arrangement where the face of the architrave tends to be flush with the upper surface of the column shaft, and not to overhang so boldly as it does in the Parthenon and Propylaea orders, suggests that this particular refinement was a compensatory device which was necessitated by the gradual change in relationship between the elements of the peristyle. However heavy the superstructure of Temple 'C' at Selinus may have been in comparison with later examples, there does not appear to have arisen the need for an 'all-over' tightening or strengthening of the silhouette by such a device as that resorted to in the case of the Parthenon. In the case of the earlier temple the visibly limiting lines of the entablature did not override the supporting columns, and therefore did not suggest strain or disrupture in the composition.

(c) *Entasis in the Columns*. The acknowledged purpose of this modification to column shape is to offset the possible concavity of effect which tends to accompany a straight sided column. According to Penrose's finding the total increase (at the maximum point about $\frac{2}{5}$ the height of the column) amounts to about $\frac{1}{55}$ the lower diameter.

(d) *Increased diameter of Angle Columns*. The increased girth of the angle columns appears to have been a device to avoid an effect of weakness where the columns are often seen in silhouette against the sky, in comparison with the remainder of the peristyle which is 'read' against the opaque walls of the cella. If this explanation is the correct one, the change in diameter is a matter of direct optical correction, and an understandable one in view of the siting of the temple which stresses the oblique viewpoint, and which in turn renders an impeccable three-dimensional harmony essential in the total structure.

(e) ***Inward slope of Architrave, etc***. The inward slope of the architrave echoes the 'pulling in' of all principal vertical surfaces, and

their final resolution (on the end elevations) in the rapidly converging lines of the pedimental mouldings

The technical achievement is impressive, and so also is the unrelenting search for perfection in relationship and completing unity. We must ever be amazed at the singleness of purpose and the idealism that made such an undertaking practicable For here is no utilitarian project, no state construction for defence or public welfare, but a demonstration of human inventiveness in the satisfaction of aesthetic demands The Doric temple approaches universality and sublimity in its high degree of abstraction, and in Blomfield's felicitous phrase "It is (the) abstract quality which lifts Greek Doric so far above the ambitious art of later ages, and indeed above all but the very finest work of any period of architecture "[38]

8 TEMPLE SCULPTURE

General There has been reference to sculpture in the discussion on colour in the Doric temple, and we may conclude this section on the temple by a brief statement on the characteristics and placing of sculpture in that context Three zones were employed for specific application (*a*) *The Metopes* (*b*) *Continuous friezes* (such as that representing the Panathenaic procession on the outside of the Parthenon cella wall), and (*c*) *The Pediments*

Free-standing statues such as those representing the god to whom the temple was dedicated and which stood in the cella do not form a structurally unified part of the building, and cult statues placed outside the temple but within the temenos do not come within our present survey The latter however, played in many cases an important part as accents in the general grouping of forms within the temenos, and as such we may have occasion to discuss them later At present we may note the dominant statue of Athena Promachos on the Acropolis at Athens which was an entity of sufficient bulk to constitute a focal point within the sacred enclosure

(*a*) *Metopes* Metopes commonly took the form of sculptured panels set between the triglyphs, and achieved at different

[38] BLOMFIELD Page 154.

periods a varying degree of architectonic unity with the other elements of the Doric temple We have seen that a high standard of unification was attained in the metopes of Temple 'C' at Selinus, where the geometry of the temple design was strongly echoed in the formalism of the figure treatment in these panels Lawrence[39] places these metopes close to 500 B C, although he quotes the opinions of Studniczka and Langlotz as suggesting 540 and 520 B C respectively Charbonneaux[40] places them in the first half of the sixth century, and suggests the Perseus and Medusa metope as "*le meilleur exemple d'une scène théâtrale incluse dans un cadre architectural* " Fougères[41] sees in the group depicted an action that is as '*rapide comme une scène eschyléenne*' The arrangement of the figures in this metope shows a close approach to the isocephalism of the vase painters, in that the raised hand of Perseus is placed so as to bring the level of the Medusa form to that of the heads of Perseus and Athena

An example from Delphi (mentioned earlier in the discussion on colour) is worthy of note The 'Cattle-raid' fragment of the Sicyonian treasury (*Plate* 21) lacks what Charbonneaux calls '*la rudesse presque brutale*' of the Temple 'C' metope, and though dating from about the middle of the sixth century displays a sense of movement that contrasts strongly with the atmosphere of tension and suspended action that marks the Perseus and Medusa metope

Picard and de la Coste-Messelière[42] describe this movement of the marching figures – "*ils vont d'un pas cadencé, dont le rythme militaire s'impose curieusement aux animaux escortés* " Removed from its setting this small panel (only 22½ in in height) with its ambitious and complex arrangement of human and animal forms offers within the depth of its modelling (about 2¾ in) a small-scale demonstration of spatial control and formal rhythm that is symbolical of the whole range of Greek plastic art It should be remembered that this sculpture was much closer to the spectator than the Selinus example owing to the smaller dimensions of the treasury, and therefore a finer scale was not only commensurate with its setting, but from a purely pictorial point of view, justified

[39] LAWRENCE Page 145
[40] CHARBONNEAUX Page 23
[41] FOUGÈRES Quoted by Charbonneaux, loc cit
[42] PICARD and DE LA COSTE-MESSELIÈRE Page 10

Especially significant in relation to the spectator is the great complexity of form, and the bold essay at internal rhythm. At Selinus there was, in the three salient figures, a static arrangement whose rigidity contributed to the collective rhythm of repeated metope and triglyph, in the example from Delphi there is a sign that the sculptor is not always willing to subordinate his art to the dictates of an architectural framework, and the work of succeeding centuries will show the effects of this independence One hundred years later the Parthenon metopes recorded the degree of freedom reached by the sculptor, and here naturalism and suggested movement are such as to negate all idea of formal rhythm

(*b*) *Frieze* The frieze in Doric architecture[43] is of secondary importance, and in the present survey we need mention only one example (actually Ionic) which is interesting from the point of view of spatial treatment The Treasury of the Siphnians at Delphi, built about 525 B C, though only a small building, "is one of the most richly decorated of such buildings that ever existed The whole (being) built of Parian marble and brilliantly coloured "[44] In the fragment illustrated (*Plate* 22) (25 in high) there is a notable display of vigour and brilliant arrangement within the small compass of 2½ in depth of carving Seven or eight planes are defined within this depth, and the square cutting back from these almost flat surfaces imparts a precision and austerity that accord well with an architectural setting

(*c*) *Pediment* The free-standing sculptures of the pediment presented a peculiar problem to the sculptor At first glance the horizontal and raking cornices appear to offer an admirable framework for a group of statues, but the exacting nature of the space so defined, and the rapid diminution of practicable volume towards the outer edges imposed an acute restriction on the grouping and scale of the enclosed and separate forms

As one may expect the development of pedimental treatment echoes that of the metope, and in a parallel sense reflects the changes that occurred in the relationship between the purely architectural forms as they were modified during the period 600

[43] PICARD *Manuel* Chap VII generally and Fig 117 for arrangement of frieze on five Doric temples

[44] ANDERSON, SPIERS, and DINSMOOR Page 106

to 400 B C For our present purpose it is proposed to examine four arrangements distributed over this period, and in so doing, to attempt an estimate of the spatial effect achieved in each case

The examples are as follows

(*a*) Pediment from the Temple of Artemis, Palaeopolis, Corcyra about 580 B C

(*b*) Pediment from the Temple of Aphaia, Aegina sculpture *c* 480 B C

(*c*) Pediment from the Temple of Zeus, Olympia 460 B C

(*d*) Pediment from the Parthenon, Athens 447 B C

(*a*) *Temple of Artemis, Palaeopolis* The pediment of this temple has been restored by Buschor from fragments found in 1910 [15] The scheme is an extremely direct one, boldly articulated, and powerful in effect through the restricted number of elements in its composition The focal point is provided by a large Gorgon over 9ft in height, and flanked by her attendant animals (lions or leopards) and by her offspring Pegasus and Chrysaor To a smaller scale battles between the gods and giants are portrayed towards the angles The handling of the main elements, particularly of the large animals, is masterly in its adjustment to the sloping shape which contains them The elastic upward sweeping curves of the leopard backs, and the dramatic closeness with which the whole animal form fits the lines of the pediment once more demonstrate the peculiarly archaic vitality to which reference has been made earlier

The complete change of scale for the groups of gods and giants is a daring device that results in a note of visual tension The method of filling the greater part of the space with a large-scale group rather than dissipating the interest over a multiplicity of smaller forms is an early triumph of space arrangement in this exacting context We may note in this example that "In all the human figures there prevails a heavy rectangular structure, due to the flat, broad surfaces by which the body is rendered "[16]

[15] Two excellent photographs (Plates 24 and 25) appear in CHARBONNEAUX showing details of leopard and Gorgon ROBERTSON shows Buschor's restoration, page 70 LAWRENCE Fig 19

[16] LAWRENCE Pages 110 and 112

This attribute accords with the treatment of the Selinus metopes, and offers an interesting forecast of the technique of the Siphnian frieze

To summarize, the Artemis pediment shows (*i*) a minimum number of elements, (*ii*) a bold separation of these elements which thus retain their individuality within the frame, and (*iii*) a strong rhythm that carries, however, little suggestion of potential movement within the figures themselves

(*b*) *Temple of Aphaia, Aegina* The 'transitional' temple of Aphaia shows a considerable change in attitude to the treatment of pedimental sculpture The remains of the sculptures of this temple were discovered amongst its ruins in 1811, and are at present in Munich The west pediment was first reconstructed by Thorvaldsen, later by Furtwangler (with additional material) and still further modified by Schrader Lawrence[47] refers to the west figures as being "thinner, harder, more compressed" (than those of the east pediment) the facial treatment still showing the 'archaic smile' while the east figures "are more contoured, of greater fullness and softness of form " A figure from the west pediment is "still of conventional construction

Frazer[48] finds that "Their style is on the whole hard, stiff and wanting in idealism " On the contrary one must suggest that this 'hardness' and 'stiffness' be taken as a realization of the primary restriction of architectural sculpture – that the architectonic mood of the whole shall not be weakened by misplaced naturalism It is true that the grouping and scale of the figures indicate the growing desire for suggested action and greater strain in the positions assumed by the figures What Frazer (and many of the critics of the nineteenth century) felt to be an inadequacy is more justifiably to be explained in terms of the aesthetic intention of the Greek Doric temple as a whole rather than from the standpoint of later naturalism which has always offered a tempting standard by which to measure earlier work [49]

The west pediment at Aegina[50] shows thirteen figures of which the central figure is upright the remainder being in

[47] LAWRENCE Page 149.
[48] PAUSANIAS Vol 3, page 271
[49] MARTIENSSEN *Changing* (S *Afr archit Rec* 18 161–72, 1933)
[50] CHARBONNEAUX Pages 20–1 reconstruction drawing of West Pediment, Temple of Aphaia, Aegina

various positions dictated by the exigency of their settings. Immediately on either side of the centre line are two balanced groups of three, each containing two opposing figures in combat with one reclining between them In the next zone there are again three figures on either side – two kneeling or crouching and one reclining The greater number of elements produces greater continuity of pattern, and consequently rhythm of a smaller measure than that which we have seen in the Artemis temple in Corcyra We are not conscious in the present scheme of boldly carved 'objects' set in a frame in such a manner that their own identity is clearly maintained within the greater unity of the temple fabric Within their smaller pattern, however, the figures are carved with a degree of formal organization that is consistent with the lessened archaism of the temple itself

(*c*) *Temple of Zeus, Olympia* The pediments of the Temple of Zeus – only a few years later than those of the Aphaia temple – show a considerable increase in the number of figures and a greater degree of 'realism' than appear in the earlier example The generally accepted reconstruction of the west pediment by Treu[51] with its strong triangulation and rhythmical grouping (the figures are arranged on a system 1, 3, 2, 3, 1, 3, 2, 3, 1) achieves a greater compactness than was possible with the fewer figures and less flowing relationship of the Aphaia pediment

(*d*) *The Parthenon, Athens* The evidence for the arrangement of the pediments of the Parthenon is provided chiefly by Pausanias description, and by the drawings attributed to Carrey and made before the explosion of 1687 [52] The style of the individual figures has been summarized by Lawrence[53] in the following statement "A discreet naturalism, in which the sense of pattern is never overwhelmed, marks the rendering of the nude, while richness is the prevailing quality of the drapery" The definition of pattern must be a wide one to embrace the disconcerting richness of the treatment, for in these figures there are only softness and flow that border on the amorphous, and one

[51] GARDINER Fig 83, Treu's reconstruction
[a] GARDNER Pages 119–21, discussion on this example
[52] FOUGÈRES Photographs of pediment remains, also reproduction of drawings attributed to Carrey (Plate 46) Vol 1, 2nd album
[53] LAWRENCE Page 203

seeks in vain some of the structures and firmness of 'archaic' work that legitimately relates the sculpture to its setting Gardner[54] refers to the Parthenon arrangements as "the acme of pedimental composition" but fails to convince one by his cursory example of "subtle balance and rhythm" in the east pediment

It is only too apparent that the rich verisimilitude of drapery, and the technical mastery of free form have become desirable conditions in themselves with an incalculable loss of meaning in the architectural sense Examination of free-standing sculpture of the second half of the fifth century and of the fourth century confirms a steady decline in formal significance which was inevitably reflected in temple sculpture.

DESCRIPTIVE NOTES ON DORIC TEMPLES REFERRED TO IN THE TEXT

TEMPLE 'C', Selinus, Sicily 570 B C, 6 × 17, 23 63 × 63 765 m on stylobate A few columns re-erected on the site, two of the metopes in Palermo Museum

BASILICA (Temple of Demeter and Kore), Paestum, Italy 565 B C, 9 × 18, 27 525 × 54 295 m An exceptional columnar arrangement

TEMPLE OF APHAIA, Aegina 490 B C, 6 × 12, 13 80 × 28 50 m

TEMPLE OF 'JUNO LACINIA', Acragas, Sicily 470 B C, 6 × 13, 16 895 × 38 13 m

TEMPLE OF ZEUS, Olympia 460 B C, 6 × 13, 27 68 × 64 12 m

TEMPLE OF POSEIDON, Paestum 450 B C, 6 × 14, 24 285 × 59 99 m

PARTHENON, Athens 447 B C, 8 × 17, 30 86 × 69 51 m

TEMPLE OF 'CONCORD', Acragas 440 B C 6 × 13, 16 23 × 39 44 m

TEMPLE, Segesta 430 B C (not completed), 6 × 14, 23 25 × 57 50 m

TEMPLE OF POSEIDON, Sunium 425 B C, 6 × 13, 13 48 × 31 15 m

TEMPLE OF ASCLEPIOS, Epidaurus 380 B C, 6 × 11, 11 90 × 23 00 m

TEMPLE OF APOLLO, Delphi 513 B C, 6 × 15, 23 80 × 59 50 m

NOTE In each case the date is approximate, the dimensions of the stylobates are those given by Robertson *Greek and Roman Architecture*, Appendix I

[54] GARDNER Page 123

V

TEMPLE AND TEMENOS

I FESTIVAL AND SACRIFICE

We have examined in the last Section the general '*ordonnance*' of the Doric Temple and the details of its corporate elements. With an understanding of the appearance and effect of the temple our next step is to investigate its siting and the treatment of its surroundings as evidence enables us to reconstruct the complete scene in historic times Detailed study of the question of ritual and its manifestation in athletic, musical, oracular, and other special forms of ceremony lies outside the scope of the present thesis, but we may briefly note a few conditions that have a bearing on our particular aspect of the architecture of religious institutions

The festival in Greece occupied an extremely important place in daily life, and it is estimated that in Athens about seventy days in the year were given up to 'holidays' of one type or another [1] The succession of religious festivals according to Plato[2] was created by the gods as a rest for men from their labours The civic festivals, especially spring and harvest celebrations, were probably common in most respects to all Greek states, although the times of these did not always coincide owing to "the erratic nature of the Greek calendar"

Confederate festivals, in which a group of states worshipped some divinity at an established centre were common in early Greece, and such amphictyonies as those which united in worship of Apollo at Delphi gave a special character and meaning to the selected sites The four national festivals – Olympian, Pythian, Isthmian, and Nemean – had a strongly unifying effect in Greece, and as Gardner suggests 'were not so much of a spontaneous growth as due to the encouragement of far-seeing

[1] GARDNER in Whibley Page 406

[2] PLATO *Laws* Bk II, page 653 d, quoted by GARDNER, loc cit

politicians, especially the enlightened tyrants of Argos, Corinth, Athens, and other cities"[3] The Pythia originated in the meetings of the Delphic amphictyony, and, no doubt influenced by the famous oracle, achieved universal recognition Olympia was early recognized as "the chief centre of the worship of the Olympian Zeus in Greece", and the Isthmia and Nemea "probably owe their celebrity to the early importance of Corinth and Argos, which respectively presided over them"

Of special interest to our present purpose is the manner of worship, and as sacrifice was "the central and essential point of all acts of worship in Greece" it would be as well to record the proceedings during an actual ceremony Most sacrifices were offered at the altar which stood in front of the temple, the latter thus served the purpose not only of a house for the god, but also of a splendid focal point or screen against which the elaborate rites could be enacted Gardner[4] gives us an excellent picture of these rites

"The proceedings at the actual sacrifice were usually the same First came the preparations, garlands were worn by priests and by the victim, whose horns were often gilded Then it was led to the altar if it struggled, the omen was bad, if it bowed or shook its head, the omen was good Next a bowl of water was sanctified by plunging in it a torch from the altar, and all present were purified with it and the altar sprinkled In the sacred silence which followed came the prayers Then came the sprinkling, on and around the victim, of the grains of barley brought in a flat basket, which was therefore among the essential implements of the sacrifice After this began the sacrifice itself, first some hair was cut from the victim and thrown in the fire, then it was stunned with an axe or club, its throat was cut, and the blood caught in a vessel, the head being turned down for Chthonian gods, upwards for others the blood was poured on the altar or sprinkled over the worshippers if the rite was piacular (Flute-playing accompanied these proceedings) Then the victim was skinned and cut up, the entrails were inspected for the purpose of divination, and the portions set apart for the god were burnt on the altar Usually they were the thigh-bones and fat and portions of each joint, and the tail The rest was cooked on spits and divided among those present

* * *

"The Greek worshipper prayed standing, with his hands raised,

[3] GARDNER Page 408
[4] GARDNER Page 405

palm upwards, to heaven, if he addressed the gods below, he might stretch his arms downward, stamp on the ground to call their attention, or kneel to touch the ground with his hand, but kneeling in prayer, except with this motive, was regarded as barbarian and unworthy of a free man Prayer was usually made aloud "

Of sites, Socrates[5] says that "the most suitable ground for temples and altars is that which is most open to view, and least trodden by the public, for that it was pleasant for the people to pray as they looked on them, and pleasant to approach them in purity"

Of the constitution of an actual festival procession we can gain an excellent idea from the Panathenaic frieze of the Parthenon in which is depicted all the equipment of ritual, and all the paraphernalia of sacrifice, carried by the streaming crowd through the Propylaea, the animals following with their attendants Schede[6] describes the events of the chief day of the great Athenian festival as beginning at sunrise with the gathering of the people in the town below, and their setting off in a procession through the main streets towards the Acropolis

In fifth-century Athens, where festivals and sacrifices were frequent and on a large scale, support from the state as well as from the treasuries of the divinities was the general rule[7] The building of such structures as the Parthenon and Propylaea involving as it did such a large outlay, is a practical indication of the dominant place of religion in public life

2 ELEMENTS OF THE TEMENOS

In general we may note the occurrence of six separate elements, or classes of elements, in the Greek temenos

(*a*) Propylaea, (*b*) Altar, (*c*) Temple, (*d*) Treasury, (*e*) Stoa, and (*f*) Sculpture

The temenos itself, as we shall see later in our investigation of extant examples, varied considerably in area, situation, and configuration In briefly discussing the characteristics of the

[5] SOCRATES *Memorabilia*, Bk III, chap viii, sect 10
[6] SCHEDE *Acropolis* Page 79
[7] TOD in Camb Anc Hist Vol 5, page 29

components that were arranged within the boundaries of the temenos we shall not be specially concerned with their position.

(*a*) *Propylaea* The Propylaea provided at once a monumental entrance to the sacred enclosure, and a sense of deliberate separation from the surroundings in which it was set The form of the propylaea (or propylaeum) echoed very closely the type of double portico that was employed in Mycenaean times as, for example, in the approach to the outer and inner courts of the palace at Tiryns. Thus on plan it consisted of two porches united in a single overall volume, with columns in antis, the separation between these porches was a wall with openings the plane of which approximated to the plane of the temenos wall or peribolos From both outside and inside the elevational appearance was that of a small temple with pedimented ends The propylaea did not always assume this minimal form, in the case of the Acropolis of Athens for instance, where the site was extremely difficult of access, and where a supreme effort to maintain a powerful architectural unity under exacting conditions involved a special solution, the forms of the propylaea were correspondingly complex

(*b*) *Altar* The altar, focal point of the temenos from early times, provided the open-air centre of ritual activity, and as the temple was not entered as a place of assembly, it must have assumed considerable importance as the visible and accessible setting for practical sacrifices and ceremonies While the temple remained an aloof and enduring symbol of the god – a background – the altar was indicative of immediate and temporal activity A notably fine setting for the altar is that to the east of the so-called Temple of Juno Lacinia at Acragas In this example the formal arrangement of terrace and steps, and the lofty situation of the temple combine in an effect of great dignity [8] A key plan of the arrangement is shown

(*c*) *Temple* The Temple has been discussed as a consciously created structure embodying established and developing aesthetic principles In the present note it is only necessary to

[8] STUART and REVETT Vol 4, notes on, and plan and section of arrangement of Temple of Juno Lacinia at Acragas

state that the temple housed a sculptural representation of the divinity concerned, and often served in addition as a store for tribute money and offerings Almost invariably the principal entrance faced east (or nearly east) and the altar lay on this side, and some distance from the temple (An exception to this orientation is the Temple of Apollo at Bassae which faces north)

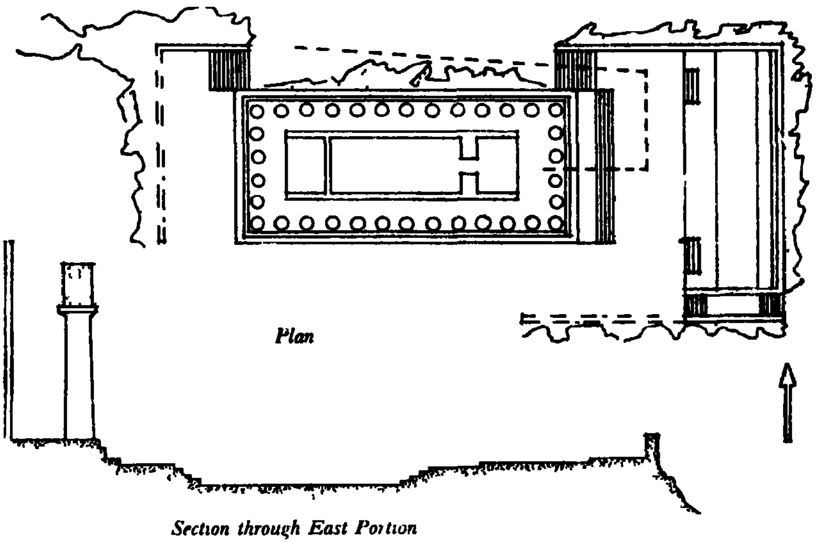


Fig XII Arrangement of the Temple of Juno Lacinia at Acragas
After Stuart and Revett *Antiquities of Athens*

(*d*) *Treasury* The treasury, which commonly took the form of a small temple with columns in antis, was not an invariable component of the temenos, but in the great religious centres such as Delphi and Olympia which were pan-Hellenic in intention, it symbolized the homage of individual cities, and numbers were erected to this end All that has been said of colour treatment, the arrangement of the 'order', and the general architectural qualities in the temple, are reflected in these small buildings In practice the treasury was used for the reception of arms, offerings, and other properties in conjunction with the pilgrimages made to the sacred shrines *

* ANDERSON, SPIERS, and DINSMOOR Page 96

(*e*) *Stoa* The stoa, which has been defined and discussed in an earlier section, was in many instances a further architectural unit in the temenos scheme, and in some contexts played an important defining part in the general scheme

(*f*) *Sculpture* Free-standing sculpture occupied in actual bulk a relatively small portion of the sacred enclosure, but as accents, and in their compelling solidity and repetition, free statues played a considerable part in the general scheme of architectural forms against which they were 'read' We may note the occurrence of exceptionally large statues such as that of the Athena Promachos on the Acropolis of Athens

(*g*) *General* Dinsmoor[10] refers to the frequent occurrence of enclosures known to have been planted with trees and sacred groves He comments that the conjectural restorations of Olympia, Epidaurus, Delphi, Delos, and Eleusis made by some of the '*Grand Prix*' students, and based on actual remains, suggest

> "a magnificence, a combination of nature and art, which it is now difficult to realise to its fullest extent, and of which the only parallel is to be found in some of the Buddhist sanctuaries in India, China, and Japan, where in consequence of a somewhat similar cult, temples, tombs, and other monuments exist up to the present day "

3 DESCRIPTIVE SURVEY OF SIX SANCTUARIES

Our next task is to examine the arrangement of the foregoing elements in specific contexts, and with special reference to the placing and appearance of the temple Since it is desirable that findings in respect of each temenos shall follow consecutively without the interruption of historical or descriptive notes, it is proposed to separate the treatment of the material into two parts, in the first the sites will be described and illustrated by a small key plan showing the principal elements, orientation, etc , in the second they will be analyzed with reference to their spatial content

[10] ANDERSON, SPIERS, and DINSMOOR Page 94.

[a] SIRÉN Vol 1, plans and photographs of Chinese monumental planning An interesting parallel to Greek work in the spatial aspect is offered by the Chinese layouts

The sites selected for treatment cover a wide range with regard to geographical and topographical situation, complexity, size, and detailed arrangement, and will be considered in the following order Sanctuaries of Temple 'C' Selinus, Temple of Aphaia, Aegina, Parthenon, Athens, Temple of Apollo, Delphi; Temple of Poseidon, Sunium, Temple of Asclepios, Epidaurus.

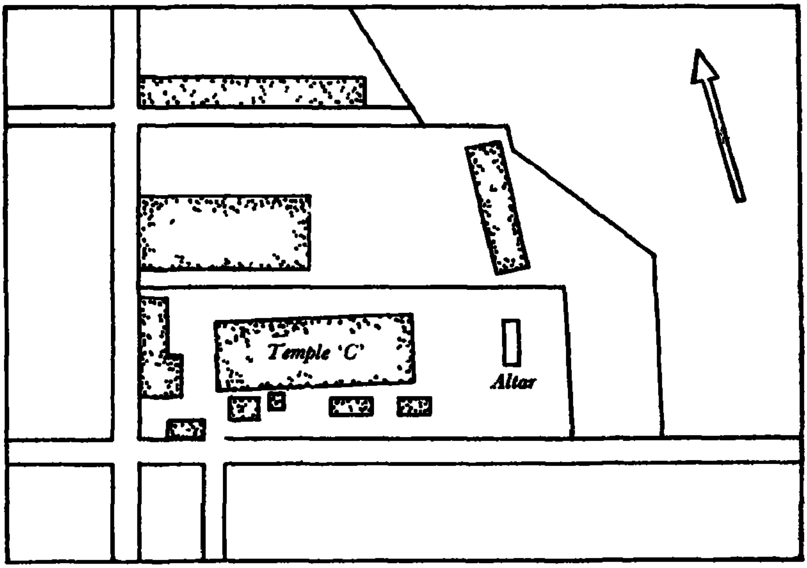


Fig XIII Diagrammatic plan of the Sanctuary of Temple 'C' at Selinus.

(*a*) *Temple 'C' at Selinus* We have seen in our examination of the Acropolis of Selinus in Section II that there is a strong possibility that a new town plan dating from the early part of the fifth century B C may have been so adjusted as to embrace the archaic temples of 570–560 B.C The fact that Temple 'D' so closely abuts on the north-south street supports this view, and points to a certain degree at least of enforced adjustment in the temple setting Whatever the street system may have been at the time of building these temples ('C' and 'D') the extant relationship is the only one we are capable of assessing, and as there is no reason for supposing that the temples were less significant in the fifth century than they were in the sixth, we may assume that

the remains represent a valid and sanctified arrangement at the time of the collapse of Selinus in the late fifth century

Of the temenos that lies to the north of the main cross-street of the acropolis, the northern half is given up to Temple 'D', the southern half to Temple 'C' The site of the latter building falls fairly rapidly towards the east, and the entrance to the sanctuary

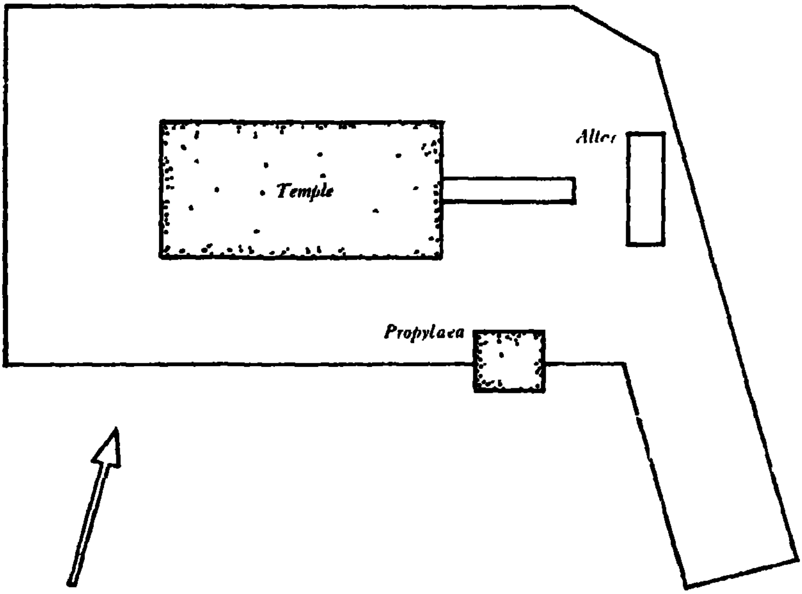


Fig xiv. Diagrammatic plan of the Sanctuary of the Temple of Aphaia at Aegina.

(immediately below the south-west corner of the temple) as shown by Hulot meets the topographical conditions reasonably The temple lies at a slight angle to the east-west street, and between it and the street lies a group of small buildings including the so-called Megaron and Temple 'B Remains of other buildings lie to the west of the temple, and the altar was placed some distance to the east of the main front The reconstruction of Selinus by Hulot which is illustrated gives an impression of the temples seen from the sea (*Plate* 7)

(*b*) *The Temple of Aphaia at Aegina* The accompanying diagram shows the three essential elements of the Aphaia sanctuary –

propylaea, altar, and temple with its approaching ramp to the main entrance The platform on which the temple stands is partly formed of solid rock, partly built up of large polygonal stones The terrace so formed is about 230 ft long by 130 ft wide, and was paved with large square slabs of stone [11] Welter[12] in his recent work on Aegina shows the development of the 'Tempelterrase' from its earliest configuration to its final form At first irregularly shaped, and with a simple gateway in the surrounding wall (the oikos and altar in approximately the positions assumed by the corresponding elements in the later arrangements), it underwent an intermediate stage which shows the same orientation of elements and in which the shape of the early terrace is broadly maintained, but in which the gateway is replaced by a propylaea The final form which we shall examine later was subjected to a considerable degree of regularizing in the shape of the temenos, an increase in its area, and a change in orientation of propylaea, altar, and temple

(*c*) *The Temple of Athena Parthenos at Athens* The Athenian Acropolis offers an extremely complex arrangement of architectural units, for not only is the site itself irregular in shape and level, and access to its surface limited and difficult, but the ambitious spatial programme upon which architecture and topography are reconciled unites factors of an almost unparalleled diversity The Acropolis rises clear of its surroundings, it is truly a 'high place' with its compact Doric silhouette visible from the sea, and its buildings still proclaiming the central thesis of their creation even in their ruined state

The diagram shows schematically the propylaea on the west the statue of Athena Promachos, the Parthenon on the south side, and to the north the Erectheion With the arrangements of earlier buildings we shall not be concerned, our interest is in the appearance of the Acropolis in the fifth century at the point of completion of the great Periclean programme To recall the multiple aspects of the Acropolis buildings one may refer to the fine records of Fougeres[13] and Picard,[14] to the studies

[11] PAUSANIAS Vol 3, page 269
[12] WELTER Figs 56, 59, 60
[13] FOUGÈRES Two Vols, photographs and text
[14] PICARD *L'Acropole* , photographs and text

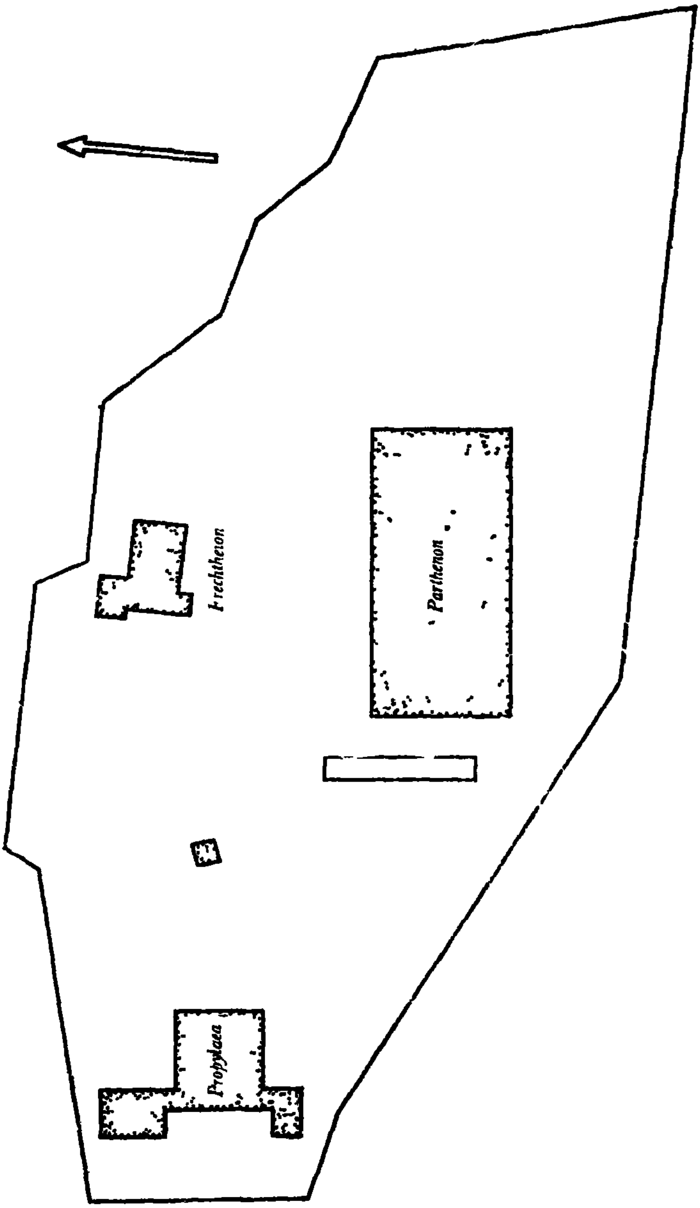


Fig. xv Diagrammatic plan of the Acropolis at Athens

of Hege and Rodenwaldt,[15] and to the detailed history by D'Ooge [16]

One aspect which will be dealt with analytically later may be mentioned at this point with the object of recording in outline the range of attitude to, and the positive research that has been undertaken on, the placing of the various buildings on the Acropolis

The apparent lack of system and of finite relationship in the arrangement of propylaea and temples has given rise to considerable speculation Penrose, whose exhaustive survey of the Acropolis structures in 1846–7 is the basis of our analytical knowledge of Doric architecture, called attention to the remarkable absence of parallelism in the location of the buildings on the Acropolis, and observed that "this lack of exact symmetry is productive of great beauty and exquisite variety of light and shade" [17] The remarkable insight of this finding has apparently escaped later students of the subject Lavedan for instance is content to dismiss this problem of arrangement with the remark

> "Les édifices, pris en eux-mêmes, sont beaux et rationnellement construits L'ensemble est une accumulation confuse d'autels, de temples, de statues, ou manquent aussi bien le recul nécessaire pour juger de la beauté de chacun, que la subordination des diverses parties au tout "[18]

Apparently Lavedan assumes that the spirit of organization that characterizes the Greeks could not find expression in practical fields

Choisy[19] on the other hand reinforces the impression conveyed by Penrose by a detailed and acute analysis of the progressive plastic effects that are offered to the approaching spectator as he passes through the Propylaea towards the Parthenon His comments indicate that he found no confusion in the group [20]

[15] HEGE and RODENWALDT *Acropolis*.
[16] D'OOGE
[17] D OOGE Page 113
[18] LAVEDAN Page 142
[19] CHOISY Page 415 ff
[20] JEANNERET-CRIS Pages 31 and 39, a recent evaluation of the planning of the Acropolis buildings

(*d*) *The Temple of Apollo at Delphi* The situation of the temenos at Delphi is of an order quite different from those already mentioned. The site is one of impressive grandeur, cradled as it is between the giant Phaedriades and overlooking the Crisaean plain which stretches to the Gulf of Corinth. The actual shape of the temenos is irregular, and the surface slopes steeply up to the

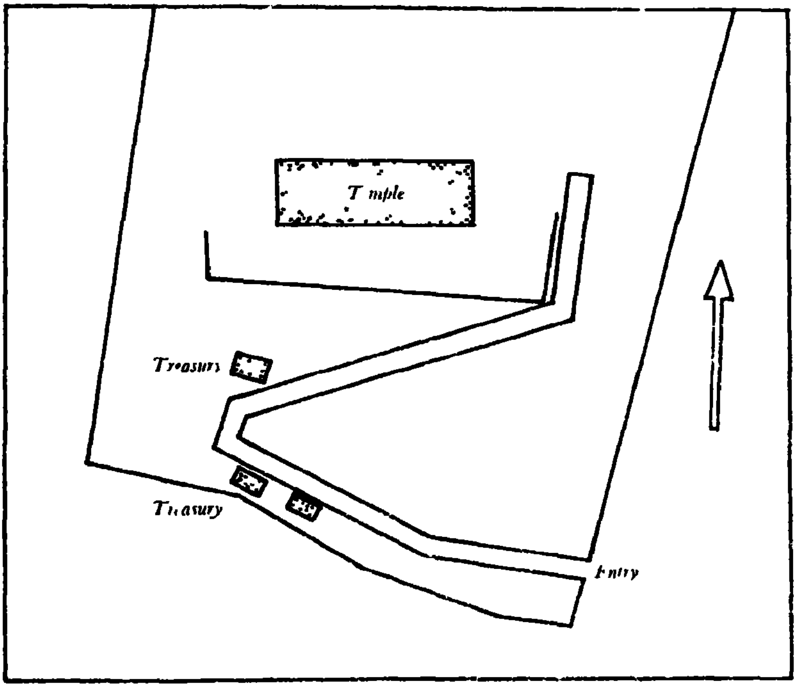


Fig xvi Diagrammatic plan of the Sanctuary at Delphi

level platform of the Temple of Apollo Above this, and to the north-west lies the second century theatre

The diagram shows the main entrance to the enclosure at the south-east corner, the 'sacred way' leading up to the temple built on a platform which in turn is supported by a polygonal retaining wall, and three of the treasuries which flank the ascending avenue The history of the Temple of Apollo is briefly as follows It was built towards the end of the sixth

century B.C. to replace an earlier temple which had been destroyed in the middle of the same century In the early part of the fourth century the new temple was destroyed by fire or earthquake, and its reconstruction was undertaken, and completed by about 330 B C

The Sicyonian Treasury (the furthest east of the three treasuries shown on the diagram) is dated by Homolle[21] between 580 and 560 B C, but although this is the accepted date of the metopes connected with this building, the treatment of the structure itself has led Dinsmoor to place it at the close of the fifth century B C [22] If he is correct the metopes must originally have been incorporated in an earlier building

The Siphnian Treasury, adjacent to the previous example, dates from the latter half of the sixth century,[23] and the Treasury of the Athenians, immediately north of the turn in the 'sacred way', was built probably between 490 and 480 B C [24]

Mention must be made of the Great Altar (or Altar of the Chians) which was situated at the point where the processional pathway ends, to the east of the temple Frazer[25] refers to the level space at this point, "the most conspicuous in the whole precinct" Here, apparently, was grouped a large number of votive offerings

(*e*) *The Temple of Poseidon at Sunium*

"Cape Sunium, now called Cape Collona or Kollonnaes, from the far-seen columns which crown its brow, is a massive and lofty headland of rugged crystalline rock running far into the sea and joined to the mainland by a low sandy isthmus The sides of the headland fall sheer into the sea in cliffs about 200 feet high On the extreme and highest point of the cape is the ruined temple of Athena (Poseidon) The platform on which the temple stands is supported on the north and west by substructures of massive blocks, built to eke out the small level space on the summit of the headland "

Thus in a few words Frazer[26] describes most vividly a temple site which has a prospect "over the sea to the islands of the

[21] HOMOLLE Pausanias Vol 5, page 271
[22] DINSMOOR Poulsen page 74
[23] HOMOLLE Pausanias Vol 5, page 272
[24] HOMOLLE Pausanias Vol 5, page 281
[25] PAUSANIAS Vol 5, page 310
[26] PAUSANIAS Vol 2, pages 1–2

Aegean and the coast of Peloponnese ." The diagram indicates the general arrangement of the late fifth-century temple in its enclosure – propylaea on the north side, temple on the south with its flights of steps, and the Poseidon monument centrally placed Although the Sunium scheme has much in common

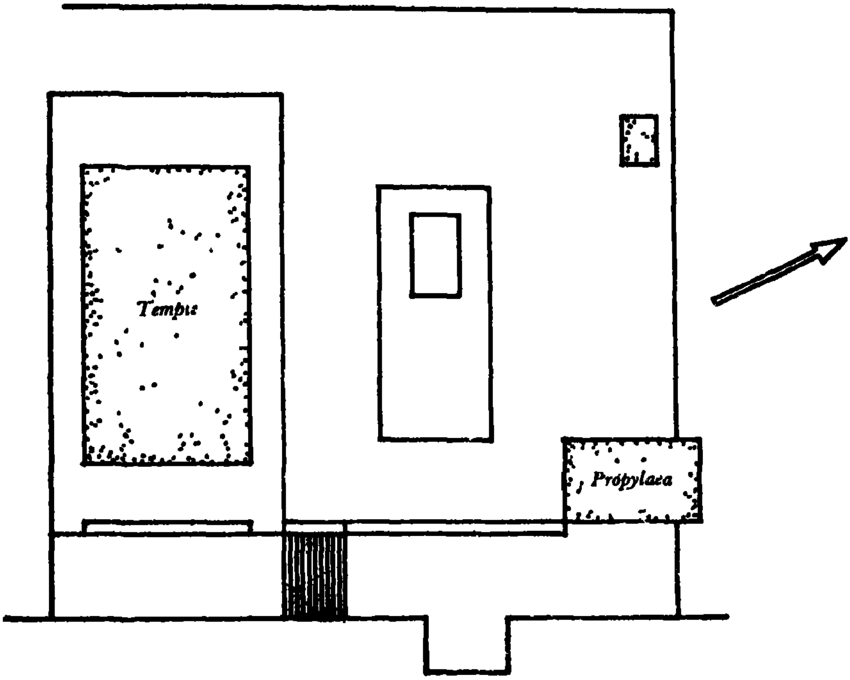


Fig XVII Diagrammatic plan of the Sanctuary at Sunium

with that of the Aphaia sanctuary at Aegina, there is an atmosphere of poise and harmony between its elements which accords with the refinement of the white marble construction of the temple, and which points to a developed sureness and subtlety in space technique that had hitherto been absent from the simple grouping of buildings on flat planes

(*f*) *The Temple of Asclepios at Epidaurus* "The sacred grove of Aesculapius is surrounded by mountains on every side " This brief description by Pausanias[27] introduces his chapter on the

[27] PAUSANIAS Vol I, II, 27, I

chief centre of the cult of healing The setting is one of the most impressive in Greece. True, there is neither the rugged wildness of Delphi nor the lyric calm of Olympia, but in what Frazer calls the 'pleasing solitariness' there lies a quality that is still capable of moving the visitor despite the fact that the buildings are sadly ruined.

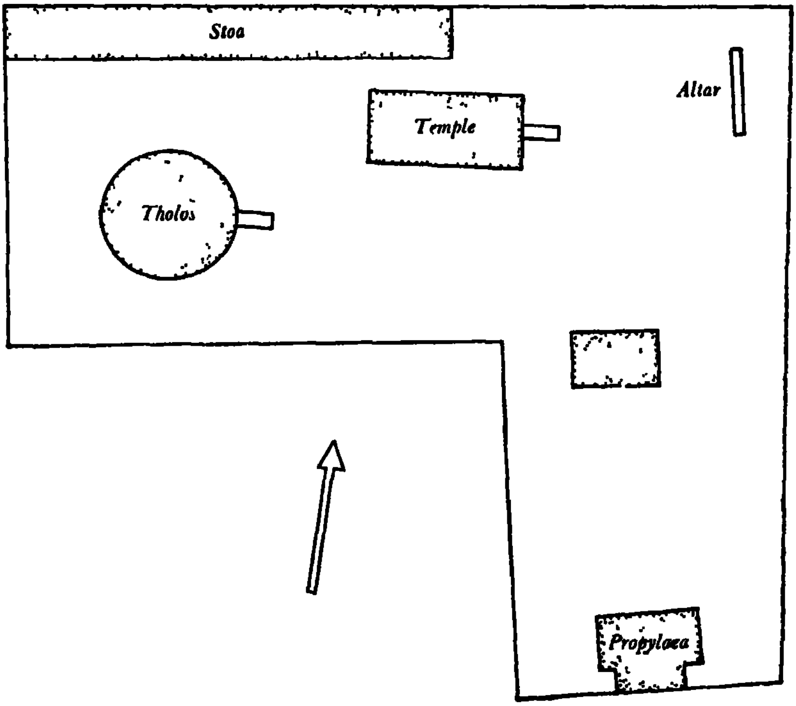


Fig xviii Diagrammatic plan of the Sanctuary at Epidaurus

The sanctuary assumed its present form in the fourth century B C, and the diagram shows what may be termed the specially sacred area This was built partly on an artificial terrace and was approached from the south through a propylaea Immediately north of the propylaea lay the Temple of Artemis, and north again the Temple of Asclepios, with the Tholos to the west. Beyond these was a long stoa, and to the east of the temple

was the altar The conjectural restorations (illustrated later in this Section) give us an excellent idea of the arrangement of the sanctuary in the fourth century B C

We have noted in the previous section some of the facts concerning the building of the Temple and Tholos at Epidaurus, any further discussion on these buildings will be reserved for the stage at which the spatial analysis of the whole sanctuary is undertaken

4 ANALYTICAL SURVEY OF SIX SANCTUARIES

(*a*) *Temple 'C' at Selinus* In this example the portion of the site which is traversed by an approaching spectator, and upon which the bulk of the temple lies, is approximately level, so that the visual experience of such a spectator will be of a 'simple' order (that is, not involving a noticeable change in level in his progressive approach to the temple) The temenos with its buildings offers in a distant view the clearly visible form of the great temple From the sea this appears as a dominant shape above the town, and on closer approach, for instance along the east-west street to the south of the temple, the long elevation is partly obscured by the smaller volumes of the 'Megaron' Temple 'B', etc

Let us assume a spectator to enter the sanctuary at the point shown on the accompanying diagram He will be immediately confronted with an angle view of the south-west corner of the temple – still partly obscured Passing the west end of the temple (for it is unlikely that the main approach would lie along the south side with the relative obstruction of small buildings), he will experience a sense of the immediacy and size of the building, the peristyle will 'read' virtually as a tall screen of columns through which he will perceive the rectilinear cella form In the short distance between the roadway and the temple there has been a rapid but restricted development of the form of the temple The spectator is too close at the point of initial perception to experience the full intent of the building, and the continuation of his path parallel and close to the building while providing a further opportunity for measuring the west front does not afford the necessary distance to widen the first impression.

Progress along the north front maintains the same type of relation that was established on the west, and it is only as the spectator approaches the altar or a point between altar and temple that the first unrestricted view of the temple is possible Even now the layout is such that by the time he is free of the north-east corner his path leads to a general area where his view of the building is planar rather than three-dimensional At any point between temple and altar he sees only the east front of the former

What are the conclusions to be drawn from this arrangement?

First, one may note the inadequate preparation for the progression The imperfectly defined entrance, the visual interference of the small buildings, and the extremely small angle which his range of vision makes with the west front result in a confused experience for the spectator The continued restriction of view until the climatic point is reached prohibits a growing or progressive conception of the whole structure Nevertheless it would be wrong to underestimate the intensely 'quantitative' experience which such a close-range succession of viewpoints would produce This lack of a harmonious perception of the temple such as that offered in later examples does incur a loss in the significance of the building as a whole, and as a nuclear form within a defining framework, but the sudden impact and maintained closeness suggest an emotional gain - a heightened sense of the local solidity and massiveness of the temple Thus the experience from a rational point of view is only partial, but a certain intuitive satisfaction – tactile rather than perceptive – is granted in its place

As far as the detail elements of the temple are concerned one may reasonably assume from its situation in the town plan that of its form the entablature with its strong polychromy would be clearly visible from the adjacent streets, while at a distance the effect would be of a boldly articulated structure, the minor components of which would not be easily separable The interesting situation therefore arises that the temple, having no real isolation from its surroundings, must have been an object that was continually within range of the populace, even when members were not specifically entering the sanctuary Thus simply seeing the temple from day to day did not in itself constitute a single or special experience, but these experiences

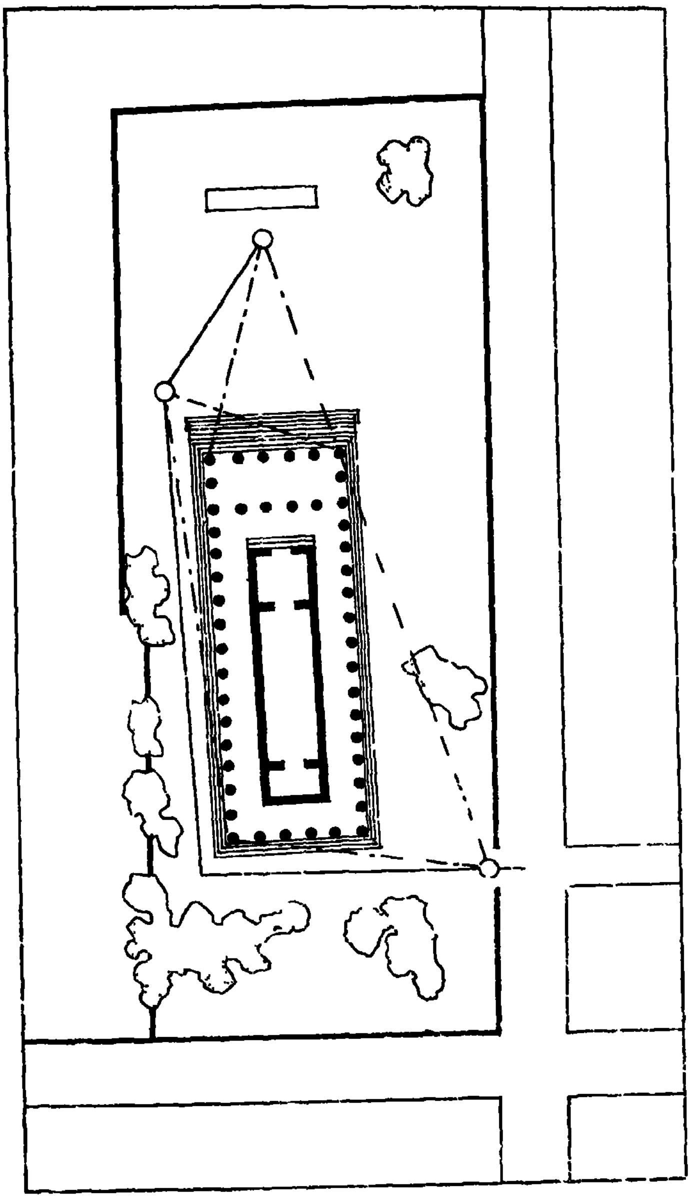


Fig XIX Plan of the Sanctuary of Temple 'C' at Selinus, showing the nature of the views obtained of the temple from points leading from the assumed point of entry to the east front of the temple

combined with the deliberate approach to the temple for festivals or sacrifices suggest an overall or integrated experience of wide range.

Movement towards the temple and experience of its forms would, from a purely visual standpoint, have normally two components

(*i*) The generalized and cumulative vision which is compounded of distant and infrequent views (the temple seen from the sea or across the bay) and recurrent involuntary vision brought about by passing the temple during daily activities, and

(*ii*) actual entry into the enclosure with the express purpose of taking part in some ceremony connected with the temple

In the first group of experiences the general form of the temple would become familiar, the upper part of the building standing clear above secondary structures or trees In the second as the analysis has shown, the forms that would be most readily apprehended would be (*a*) the crepidoma with its strong directional quality, and (*b*) the peristyle with the sharp upward movement of the fluted columns The 'cradling' of the cella within the peristyle would be clearly visible, but the polychromy, largely restricted to the upper members of the structure would not lie within normal visibility

In this example there is an obvious cleavage between the two groups of visual experience, and this arises from the availability of the building to the passer-by and the obscuring of its form by surrounding buildings The casual transition from the outside world to the inner seclusion of the sanctuary cannot be assumed to decrease this separation, as both groups of perceptive activity are characterized by incompleteness and, although the physical transition – the movement factor – may be direct and unimpeded, the visual integration must tend to remain unresolved since it lacks the common unifying factor of a relatively complete experience of the whole temple at some stage of the process

We shall see later that other arrangements will yield results that point to an increasing consciousness of the necessity for such visual unity A factor which is sufficiently fundamental to have a wide application in Greek sanctuaries may be generalized a

this point The relationship between altar and east front was virtually constant. The actual distance between temple and altar naturally varied according to the scale of the arrangement but the final point reached by the spectator in his approach to the principal front of the temple was always such as to lie between the altar and the temple, so that his view of the building was a direct planar experience. The diagram of Temple 'C' shows this final position, which one may venture to say in this case is the most satisfactory of all possible points within the sanctuary Here in the area defined by altar and temple the emphasis is thrown on to the zone of the ritual, the sacrifice with its elaborate and rhythmic motions gives practical expression to the mystical process which the individual generates in his participation. Against these activities the temple stands, a timeless background, its impeccable geometry negating the transitory, the ephemeral The approaching spectator who has measured the temple by his own movement now stands still, the movement is transferred to the ritual, and the temple, which in his movement was a changing shape, is now fixed in the calm static of its symmetry

Regarding the temple and temenos as a unity one must conclude that the restrictions of the modified site (if our conclusions on dating are valid) must be accounted responsible for the fragmentary and visually congested nature of the arrangement The strength and abstract quality inherent in the temple remain in themselves unaffected, but the possibility of their full exploitation has been inevitably lessened Only in the final stage of visual progression, as we have just seen, can the arrangement be said to approach the degree of completeness that is the reflection of the Greek attitude to the material present

(*b*) *The Temple of Aphaia at Aegina* This example of temple arrangement introduces a characteristic that does not appear in the Selinus group *The construction of a level platform* that will eliminate the accidents of an irregular setting is a significant move towards full control of the effect where the whole system consists of only a few units

The plane of reference which such a platform provides has the practical advantage of offering a convenient surface for the movement and assembly of the participants in a religious

ceremony From a plastic or abstract point of view it serves as a strongly unifying factor in the disposition of the various structures which it carries The creation of an artificial level is not exceptional in the context of Greek temple construction, in fact it is symbolical of the rigidly geometrical basis from which the whole idiom springs For we must note that the platform was not merely of a size to support the temple itself but was designed to form a local setting – a clear separation from the natural state of the site – and was thus considerably greater in area than the plan of the temple

The ruined state of most Greek temples has given rise to a misconception that 'the temple appears to grow from its site' The facts are in complete opposition to such a romantic interpretation The temple above everything proclaims its existence as a shaped, exact, and artificial construction The ravages of time have in many cases reduced the shaped stone to its original state, and this now combines in a spurious picturesqueness with the long dead site, but the effect would have shocked the Greeks as greatly as it entrances the sentimental traveller [28]

The spectator approaches the level platform, but before setting foot on its surface he must pass through the propylaea which marks the sole point of entry to the enclosure and formalizes the first view of the temple that can be obtained (*i*) on the same level, and (*ii*) within the boundary of the temenos As at Selinus the spectator will have seen the temple at a distance, although in this case the steep perspective of its situation will lessen the possibility of anything more than a fragmentary picture from below

Let us look at the propylaea in its space-defining role The chief point to note is that its walls, columns, and roof define a volume, which, by virtue of its scale is readily apprehended by the spectator Its relatively small size and the sharp decision of its surfaces enclose him in contrast to the unfettered sensation of walking on an open roadway. There is a sensation of adjustment,

[28] WEBSTER (*Classical Quart* 33 166–79, 1939) "The Greek artist sometimes indulges his love for the *precision of formal and abstract design* where it is disturbing to the modern eye, though presumably unobjectionable to the ancient " (page 171) *This reference to vase-painting may well apply to Greek architecture* Italics not in original

of preparation for an experience of architecture which the temenos is about to afford

Strictly speaking one may separate this function of the propylaea into two components The immediate, or local, and conscious experience is one of response to the architectural treatment of the propylaea itself. The spectator on entry will thus momentarily, at least, be occupied with the contemplation of forms which bear a marked similarity to those of the temple The second component is one of restriction, not easily definable in a formal statement It may grow rapidly out of the first sensation, almost as a direct extension, or it may induce in the spectator a strong sense of bodily separation from the 'outside' world from which the temenos is separated Between these limits the form of the propylaea serves to control the vision (lateral openings never occur in this element) so that during the movement towards the temenos there is a neutral zone where the spectator cannot be said to stand *outside* its area, nor yet *within* its defined boundaries

The deliberate induction of such a transitional experience is an essential factor in the creation of a system of formal architecture The correlation of movement with vision and the precise 'release' of plastic effects at predetermined points very largely determine the degree of response that can be evoked in the spectator The *depth* of the propylaea, therefore, is especially effective Without a measurable dimension in the direction of approach, conscious transition would be impossible, and in this respect the space which is occupied by the 'volume' entrance has a value which infinitely surpasses that of a mere gateway

The diagram shows the relative positions of propylaea, altar, and temple It will be seen that the inner face of the propylaea lies approximately equidistant from the south-east corner of the temple and from the south end of the altar Assuming, as we did in the case of the last example, that the general direction of the spectator will lead to a point between the east front and the altar, we note that the path taken to this end is short and direct, involving no change in direction and no obstruction to view. It will be seen also that the path does not traverse a lateral side of the temple

The first view of the temple as the spectator emerges from the

propylaea immediately discloses the chief attributes of the building, without change of position he can envisage the full extent of its form Movement towards the altar progressively diminishes the degree to which the long (south) side can be seen, and finally only the east front – in full elevation – is visible In general terms then, there is, in this short distance, a rapid visual modelling of the temple which terminates in the formal apprehension of the main front Approach to the temple itself is by means of an inclined plane, a method which also occurs in other examples, and which, from the point of view of ritual or procession, would offer a continuity of movement and a subtlety of transition that could not be afforded by steps [29]

The group of buildings at Aegina offers an admirable demonstration of the critical disposition of elements in a Greek sanctuary It has the necessary number of terms for a spatial 'equation' of an advanced order, yet it is free of secondary elements which, though they may be productive of greater refinement in the total integration, would at this stage load our discussion too heavily

The sanctuary of Aphaia has a unity of conception that is lacking at Selinus, and may thus be taken to reflect a positive stage in the attitude of Greek temple builders to the problem of providing an adequate setting for the ceremonies of the people

(*c*) *The Temple of Athena Parthenos at Athens* The Periclean scheme for a sanctuary that would surpass any known in the Greek world brought about an arrangement that is impressive for its daring and vitality In fact the Acropolis has by common judgement come to be regarded as a symbol of the highest achievement in classical architecture Our present purpose is restricted, however, to an examination of the experience of a spectator who approaches the sanctuary, so that any other form of assessment must be omitted

We have noted earlier that this particular site has received considerable attention from historians and archaeologists, at the neglect, perhaps, of other potentially interesting groups which

[29] The ramp as a means of reaching one level from another is employed today as an architectural solution where the conditions demand 'continuity' rather than separation For examples see Le Corbusier et Pierre Jeanneret Oeuvre Complète- Vols. 1 and 2

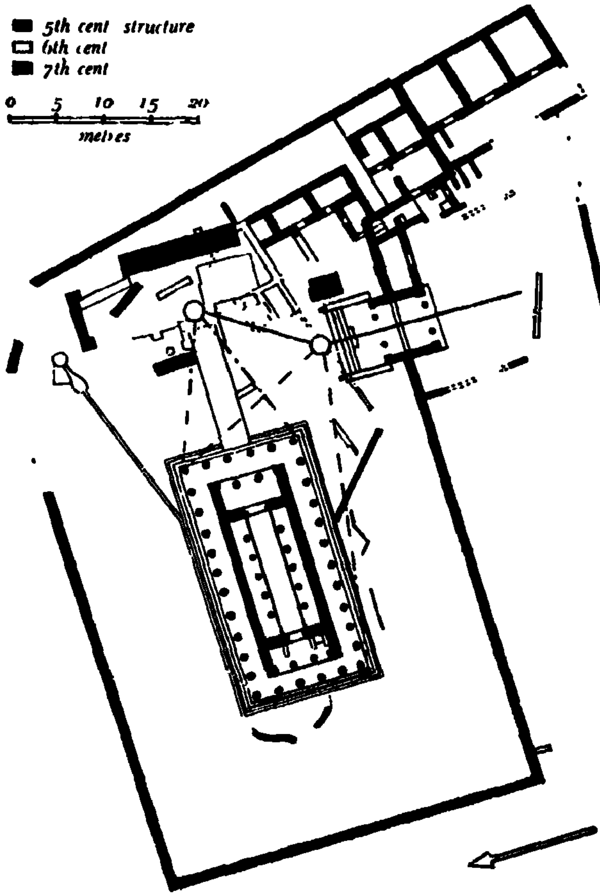


Fig xx Plan of the Sanctuary at Aegina, showing the nature of the views obtained of the temple from points on a pathway leading from the propylaea to the east front of the temple.
After Furtwängler

given the necessary investigation may well throw light on the problems of the Parthenon setting

The chief factors to be noted as a background to our analysis are as follows

The Acropolis is a bold and isolated feature of the landscape that contains it, and the buildings that crowned it appeared as a compact, unified scheme From the west the Propylaea and the Parthenon composed in a striking articulation From the south the great length of the Parthenon gave direction to the whole mass, and from intermediate viewpoints the structures combined in a changing pattern of three-dimensional effect The upper surface of the Acropolis was uneven, its outline was irregular, and approach was restricted and difficult. The Propylaea was placed at the only feasible point, on the west, and the Parthenon lay on the highest point of the Acropolis [30]

The Propylaea in this example has to fulfil not only the functions defined previously, but owing to the complexity of the site and its great area, it frames the change in level between the surroundings of the Acropolis and its upper surface This was not possible in a literal sense, the dimensions being too great to be covered by a single building of the propylaea type, but the structure is treated so that it 'embraces' the western slope of the Acropolis, and at the same time bears a positive architectural relationship with the temple that is the focal point of the sanctuary

The Periclean Propylaea is thus the most complex type that is encountered in Greek architecture, and its great size and bold silhouette do much to offset the limitations of a difficult site In earlier times a smaller and differently oriented entrance was situated at the same point, but the present structure designed by Mnesicles is on a much larger scale As finally carried out the Propylaea was only a fragment of the original scheme Dorpfeld and others[31] have suggested the form that was originally intended, but for the purpose of an investigation of its essential spatial attributes we shall forego speculation The 'depth' portion of the Propylaea was actually built, and from the point of view of the spectator this portion satisfies the needs of his approach to the sacred enclosure

[30] Generally FOUGÈRES
[a] Generally PICARD
[31] D'OOGE Page 172 ff excellent chapter on the Athenian Propylaea

On either side of the processional way projecting Doric porticoes frame the approach, and directly ahead the hexastyle colonnade of the central structure rises high above the spectator There are five openings, the central one being wider than those on either side to provide ample space for formal processions [22]

Within the structure the usual system of two porticoes is found, but two rows of Ionic columns in the west portico continue to mark the width of the central opening as far as the wall which separates the two porticoes, and which in turn is pierced by five openings The effect of this columned corridor within the portico is one of emphasis to the *depth* of the structure, and consequently of prolongation of the sense of transition in the spectator In addition there is a gradual change of level within this west portico, so that by the time the eastern limit is reached movement with two components (horizontal and vertical) has been undergone *within* the propylaea

The general space significance of the propylaea has been discussed in the previous study of the Aphaia sanctuary, we may note in the present context the additional complexity that was deemed necessary to meet the special conditions of the Athenian Acropolis

Let us imagine a spectator about to emerge from the Propylaea Ahead of him, and slightly to the north, stands the tall statue of Athena Promachos, and behind it the Erectheion To the south-east the Parthenon stands on higher ground Assuming these elements to have had no obstruction other than that caused by the sanctuary of the Brauronian Artemis, we may reasonably suppose that a procession would approach the east and principal front of the Parthenon by traversing the long north side and turning south to reach the front of the building.

In this way a progressive image of the building would be made up of

i) The distant initial view from the Propylaea, which is sufficiently removed and sufficiently far off the east-west axis of the Parthenon to give an adequate three-dimensional impression without overmuch preoccupation with its detailed treatment.

ii) An increasing angle perspective as the spectator approaches

[22] D'Ooge The central opening is 13 ft 8 in wide and 24 ft 2 in. high

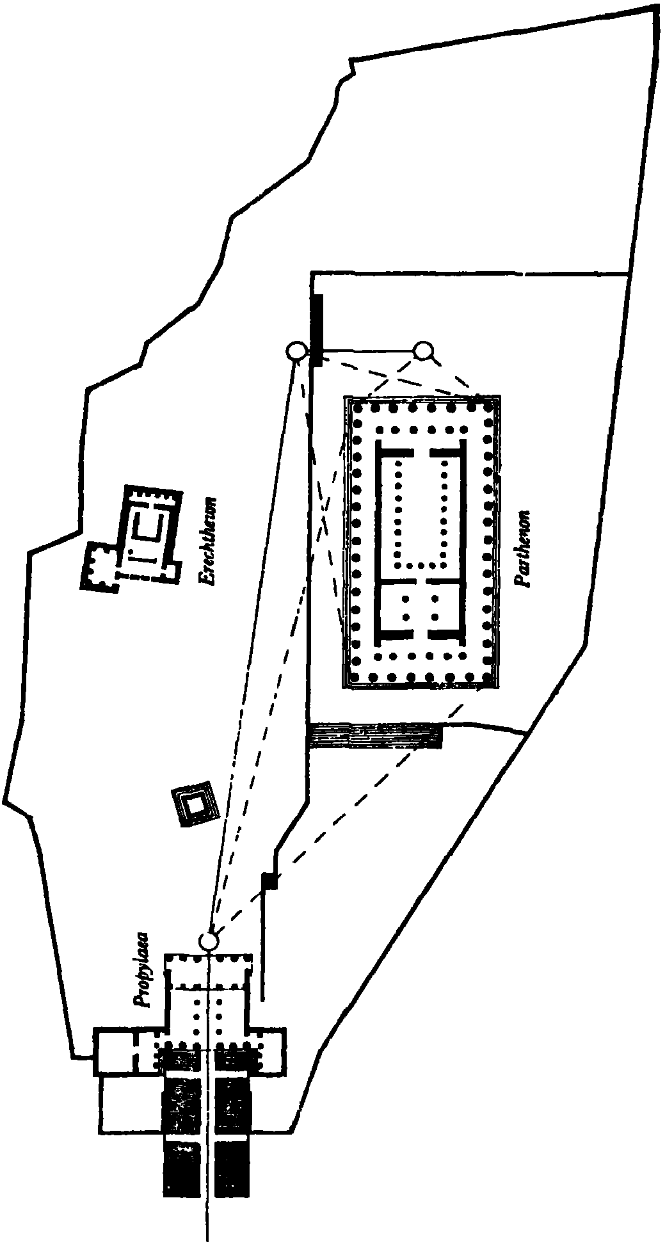


Fig XXI Plan of the Acropolis at Athens, showing the nature of the views obtained of the Parthenon from points on a path leading from the propylaea to the east front of the temple

the north-west corner of the Parthenon with growing comprehension of the architectural treatment

(*iii*) The comparatively close and unchanging view of the north side along which his path lies

(*iv*) The culminating direct view of the east front,

In comparison with the effect achieved at Selinus it will be seen that there are considerable differences in the nature of this approach to a climax, although some of the terms are common to both First, the initial view from the point of entry is a distant one, where that at Selinus was close, so that an additional space was covered by the spectator before he actually skirted the building, and secondly, the Parthenon although partially obscured by the sanctuary of the Brauronian Artemis, did not suffer the type or degree of visual interference that was encountered on entering the sanctuary of Temple 'C'.

At Aegina the initial angle view was completely unobstructed but relatively close, and the spectator in approaching the main front of the temple did not traverse its side, the degree of cognisance was therefore less complete than at Athens and Selinus, though the first 'picture' must have been sharper and more organic than it was in either of these examples

The researches of Gorham Phillips Stevens into the treatment of the Athenian Acropolis point to an entirely different approach to the east front of the Parthenon than that usually assumed from the extant remains In his recently published monograph[33] on the Periclean Entrance Court he presents arguments which, if acceptable, must revolutionize our ideas on the arrangement of the Acropolis buildings Stevens does not accept the apparent approach to have been the one employed in Periclean times He suggests that the approach was defined first by a high Mycenaean wall behind the giant statue of Athena, and parallel to the east face of the Propylaea, and secondly by the complex formed by the sanctuary of the Brauronian Artemis. Finally an irregular forecourt against the west facade of the Parthenon is postulated, and this is approached through a small propylon in its south-east corner

One immediately notes the awkward changes in direction

[33] STEVENS

involved in such a scheme (especially for processions), the unsatisfactory screening of the Parthenon, and the restricted approach to the east front of the temple According to Stevens the processions would split into two streams, one along the south and one along the north of the Parthenon

Today the spectator sees the full form of the Parthenon from the Propylaea; the lines of the crepidoma and the screen of the columns proclaim order on the sloping rock The rise and fall of distant horizons are measured by their geometric exactness If these attributes were negated by the obscuring of the temple, if the path to the altar were so tortuous and subject to so many changes of scale and so many interruptions, then the plastic effect of the group as a whole must have been sadly weakened by the dictates of outside influence Whether it was political opportunism or the sanctity of tradition that interfered with the 'pure' composition of the buildings the outcome was unfortunate if Stevens' findings are correct

If the Periclean arrangement suffered these disabilities we are forced to return to a distant view of the Acropolis, and in seeing it as a whole to seek the splendour and capture the Attic perfection in unity that were apparently denied the spectator within the sanctuary

(*d*) *The Temple of Apollo at Delphi* At Delphi we encounter a site that introduces new characteristics in the relationship between spectator and temple during the range of his visual experience within the temenos There appears to have been no propylaea at Delphi, and as we have discussed the significance of this element at some length we may at the outset inquire into its absence, and into the possibility of a compensating system that would conform with the tenets already suggested

The main entry to the temenos lies at the south-east corner, and from this point the 'sacred way' runs almost due west for about 300 ft, it then turns and for about 275 ft runs north-east. The final stage – about 100 ft – carries one north-north-west to the front of the temple The first portion of the paved pathway is lined on both sides with treasuries or similar structures, sufficiently close to one another to form an almost continuous screen. Thus despite the fact that there is no propylaea the avenue of small repeated buildings implies a sense of preliminary

enclosure before the focal point of the sanctuary is reached The screening suggested by the treasuries is naturally not so positive as that provided by a formal propylaea, as it is always possible

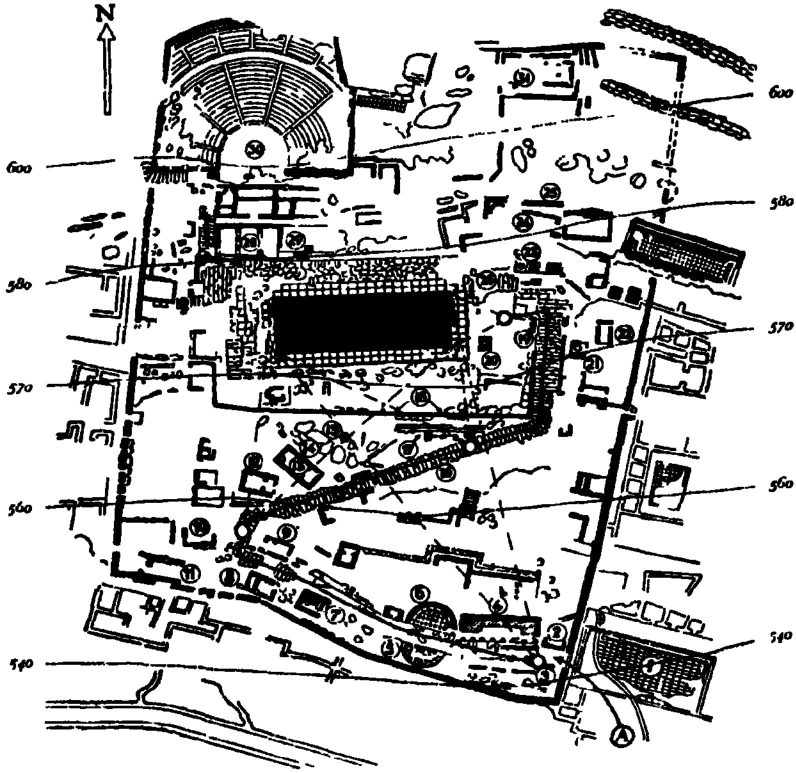


Fig XXII Plan of the Sanctuary at Delphi, showing the nature of the views obtained of the Temple of Apollo from points on the Sacred Pathway The arrow marked 'A' shows the entry, and the temple is indicated in black The contours are shown in metres, and the figures in circles indicate the following structures

7	Sicyonian Treasury	17	Portico of the Athenians
8	Siphnian Treasury	18	Polygonal Wall
9	Syracusan Treasury	19	Great Altar
12	Athenian Treasury	30	Theatre

NOTE The plan suggests the fragmentary state of the remains

to gain a view between and above them, but the great length for which the path is rigidly defined compares quantitatively, at any rate, with the momentary restriction of a propylaea

Such compensation is only made possible by the topography of the site Although a straight line drawn from the point of entry to the south-east corner of the temple measures about 300 ft, the length of the path taken by the spectator between these points is about 800 ft About three-eighths of this distance has a degree of restriction that suggests an extended propylaea which only releases the spectator at a point almost in the centre of the temenos

It will be seen from the diagram that the contours of the site run approximately east and west, and that the entrance to the temenos lies on the 539 metre contour The temple level is at 573 m, its intermediate substructure is at 571 m, and the lower platform on which the whole rests is at 566 m[34]

Let us examine the conditions encountered, without regard to the lines of vision of the spectator, but merely as he moves upwards towards the temple

(For convenience of reference the 'first section' will be assumed to denote that portion of the path that lies between entrance and the sharp bend, the 'second section' from the bend to the south-east corner of the temple substructure, and the 'third section' from this corner to the great altar)

The path ascends the slope at a gradient of about 1 in 10 until the end of section two, where it turns steeply upwards at a gradient of about 1 in 4 *Plate* 24 was taken just before the end of section two of the path, looking north-east On the left is seen the polygonal wall of the temple terrace and the remains of the Athenian Stoa *Plate* 25 gives a view looking down the steep third section, with the valley below The terrace retaining wall can be seen on the right

The extended approach at Delphi is worthy of detailed consideration since the whole of its length is included within the area of the temenos, and the effects that result from the arrangement of path and buildings are not merely the fortuitous product of viewpoints selected from strategic positions that have

[34] A convenient contoured map is that given in BÉQUIGNON *Baedeker* (1909) gives no contours or levels

no intrinsic connexion with the temple complex Let us now trace the visual progress of a spectator within the temenos

His first view on entering the enclosure shows the Temple of Apollo in steep perspective and relatively small, eye-level being approximately 105 ft below the stylobate of the temple The long, south side predominates almost to the exclusion of the east front At the end of the first section the spectator is higher, and nearer the temple At this point he has progressed so far laterally across the long side of the temple that the *west* front is just visible Just before the end of the second section he views the temple from the same direction as he did initially at the entrance, but now at 560 m he is 65 ft higher than he was at the entrance, and instead of being 300 ft distant from the building he is only 100 ft from it

The effect, then, at this point is one of a close angle-view, eye-level being about 35 ft below the stylobate Progress along the steep third section discloses more and more of the east front, and the spectator rapidly attains the same level as that of the intermediate substructure The final view of the temple as in the other examples is a direct one, the actual approach to the temple being by means of a ramp

Such a long sustained approach cannot do otherwise than induce in the spectator a mounting sense of climax, and it is in the arrangement at Delphi that one sees a parallel to the construction of the Greek tragedy Both in architecture and drama the end is in sight, the spectator is familiar with all the elements that go to make up the particular unity to which they subscribe He cannot influence the outcome of the plot in the one case, nor can he modify the arrangement in the other – but in each he is subject to a form of compulsion that renders the end more vital and more moving than if the suspense' had been built up of elements of which he had no previous knowledge Perhaps nowhere else in Greece has this ineluctable necessity of fulfilment in the spectator been better demonstrated than at Delphi, nor can surroundings be conceived of that could contribute more vividly to the mood of such an experience

In formal terms the experience assumes a rather dry aspect, but as we are concerned with the spatial aspects of Greek architecture we must proceed to a summation that will aid a general finding in this respect

Our study of the spectator's path showed that his progress was marked by a continually changing view of the temple above, and that the succession of 'pictures' so formed in his mind was the result of sustained movement towards the object of attention That each picture was different was due to the changes in direction with regard to the object that his path caused between initial and final positions Thus change in apparent size and in apparent configuration was dependent upon *movement* and *direction* The movement was of a complex nature,

(i) Because the spectator began moving at a different level from that of the viewed object, and maintained a changing level until the conclusion of his approach, and

(ii) Because the direction was not constant, four major changes of direction are undergone before the temple is reached

The implications of these two factors may be assessed more directly, perhaps, if we set down what results would have been obtained

(*a*) From movement in the direct approach to an object, with level constant and direction constant, and

(*b*) From movement involving change of level but constant direction.

In the first case (i) the spectator would (supposing he were approaching the angle of a Greek temple) receive a series of impressions of the three-dimensional form of the temple between the limits of his initial and 'small' view of the temple, and his final and close view The process of movement and vision here results in a graded and cumulative 'picture' of the object seen, but except for apparent changes in the relationship between minor portions of the structure due to the changing viewpoint, the characteristics of the object would remain the same throughout the distance covered The limit of visual experience is set at the starting point with regard to horizontal range The final viewpoint has a restricted horizontal dimension, but approach to that final position will increase the range of visibility of horizontal surfaces. Immediately against the angle of the temple, for instance, the spectator would be able to see the modelling of the echinus, the underside of the architrave,

the coffering of the pteron ceiling, etc., none of which was available to him at a distance.

Let us now suppose that the temple is approached so that once again the *direction is constant*, but on this occasion the *level is changed* at a constant rate. Assume that the spectator approaches the building, starting at a distance from it, and below its level, and ending close to the angle, and on the same level as the stylobate. Once again the horizontal limits of vision are fixed at the outset, once again the series of impressions is completed by a final close view, but under the new conditions the moving viewpoint being from a lower level provides an increasing picture of the depth dimension of the structure (depth of pteron, depth of architrave, etc.) which in the former case was only accessible at relatively close range.

By comparison, then, the latter mode of approach gives a three-dimensional impression over a greater range than the former was able to provide. Now in both cases it is to be remembered that the experience of characteristics, other than those perceived at the beginning of the movement, was not substantially increased during the approach.

At Delphi we have the condition as in the latter assumption above, but we have in addition a succession of viewpoints that do not lie on a straight line to the temple, but that occupy positions within a wide field relative to the perceived building. Thus the visual integration of three-dimensional impressions is of a considerably higher order. As the spectator moves westwards and upwards, the lateral dimension of the temple is experienced as well as those characteristics that the steep perspective makes clear. At the extreme of westward movement the main volume of the temple is reaffirmed by an angle view of the west front. Eastward, the path gradually approaches the side of the temple and passes beyond its south-east angle, but before this point is reached the view shares (as we saw earlier) the original direction of the view from the entrance.

A wide range of plastic 'exploration' separates these points; a journey has been undertaken that ends in the same general viewpoint with which he started, but now he is closer in distance and level. The datum impression is confirmed in greater detail. The concluding terms of the integration follow one another with dramatic rapidity as the steep pathway carries the spectator

sharply upwards along the last section, and parallel with the east front The movement terminates at the suddenly gained repose of the altar space

The site at Delphi was utilized by the architects in such a way that man as a moving and perceiving entity could establish a relationship with its buildings – a relationship in which the buildings are significant not only in the timeless and static nature of their forms, but in which they offer as well a perpetual and ever fresh demonstration of his own capacity to shape and order, and to create of inanimate material an abstract framework capable of defining the geometry of the visible world In its complexity, and in our perception of the wide gamut of its spatial manoeuvres, emerges the true achievement of the Doric temple in its setting

At Delphi the experiment was of profound significance, for here architecture was the formal bridge between the unaccommodating vastness of a mountain side and the demands of a people for whom religious ritual was the practical projection of a conviction of immortality – of identification with the gods of their own creation The temple is part of the framework of ritual, with its complementary functions it can be said to represent the intellectual ordinates against which are set the violent shapes of the emotions

(*e*) *The Temple of Poseidon at Sunium* At Sunium there is a relationship between propylaea and temple which recalls that of the Aphaia group at Aegina At Delphi such factors as the occurrence of numerous treasuries and the steep slope on which the temenos lay, introduced a type of delayed approach which is not encountered in enclosures having only one important element The Acropolis at Athens, with its irregular surface and widely separated buildings, carried problems of a special nature, and definitive conclusions on the present controversial interpretation of its remains are not feasible

At Sunium the arrangement achieves a high degree of spatial harmony Here again the Greek builders felt the necessity of providing a plane surface for the temple group, and in selecting this dramatic setting for the temenos they exercised conscious control by ordering the site through the medium of a substructure of massive blocks The diagram shows the general

scheme of the enclosure, and the key section indicates the changes of level that take place within the peribolos

The spectator on emerging from the propylaea stands about 100 ft from the nearest point on the temple which lies before him so that the main (east) front is virtually out of range The long side is visible in its entirety, the stylobate being well above the level of the propylaea pavement The spectator gains therefore from his initial position a sufficiently 'straight-on' view of the temple to assess its greater dimension Comparison with the

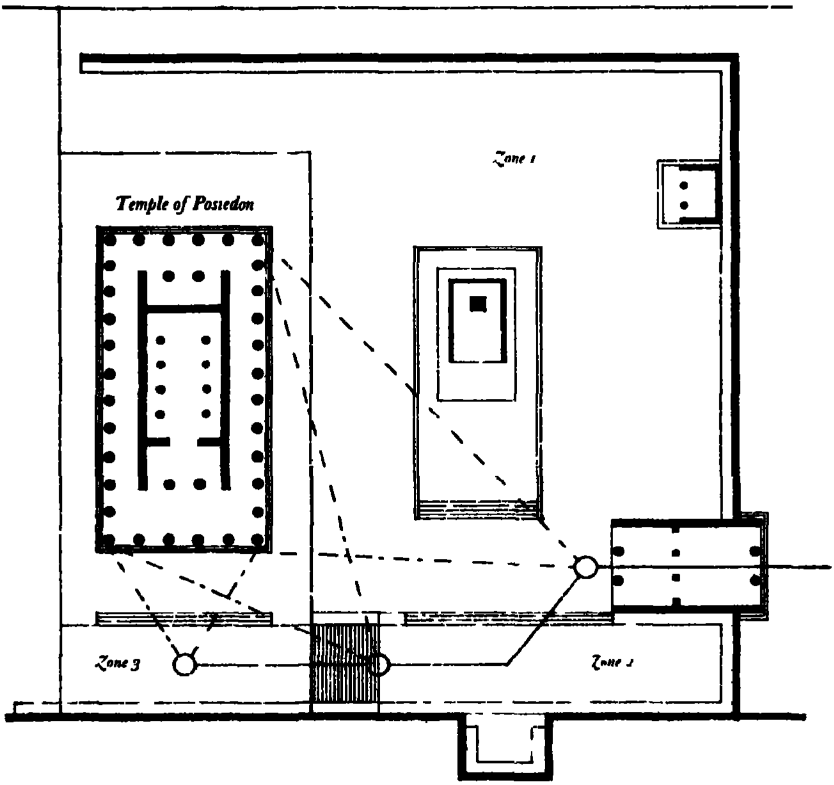


Fig xxiii. Plan of the Sanctuary at Sunium, showing the nature of the views obtained of the Temple of Poseidon from points on a path leading from the propylaea to the east front of the temple These points are situated in Zones 1 2, and 3 respectively

initial viewpoints at Selinus and Aegina will indicate the essential difference between such a long-distance approach and the sharp, angular view which occurs in the earlier examples. The spectator emerging from the propylaea stands on a level area which dominates the temenos on his left a broad flight of steps leads on to an intermediate level, which in turn gives on to a higher platform to the east of the temple Thus the approach is not only a lengthy one, but undergoes a graded change in level until the final objective is attained Four distinct levels are experienced between propylaea and temple, and during these changes a minimum of three changes in direction It will be seen from the plan that the spectator stands at each level on a *rigidly defined plane* which affords him an assessable relationship not only with the temple itself (this element being set in alignment with the peribolos), but also with the defined space of the whole temenos

The lowest level, occupying the greater part of the temenos, provides a generous and continuous forecourt to the temple – a contribution to the stability of the whole space-structure which is of cardinal value

The second level embraces an area considerably less than the first The east wall of the temenos marks its position

The third level has the same width as the second, and defines by its length the width of the temple platform

The visual range possible within each of these defined planes has a specific connexion with the temple position, and it is by correlating visual experience with the critical situation of these planes that we approach some understanding of the implications in the arrangement

The spectator walking towards the temple undergoes an experience of 'modelling' the building which is similar to those examined in the preceding cases In the path followed his successive positions are such that he becomes aware of the three-dimensional attributes of the temple This composite picture culminates as he passes the angle of the building, and assumes a 'two-dimensional' significance as he faces the end of the temple The nature of this experience, and the limits within which it can function, have perhaps been sufficiently discussed in the previous analysis. We may assume the purely visual activity to be of a generalized order arising from the characteristic position of

propylaea and temple in Greek architecture What we are concerned with is the correlation of this activity with the planes from which it is generated This necessitates a differential examination of the zones in which visual experience of the temple is possible.

Let us consider the area covered at the first level, or more briefly 'zone one' as it may be termed This is defined by the north and west walls of the temenos, the east flight of steps, and the north side of the temple platform All movement within this zone results in a predominant cognizance of the long side of the temple Lateral movement within east and west limits offers only a small knowledge of the short sides, and approach to the temple, while it increases the incidence of the vertical angle of vision, does not substantially widen the visual experience

Movement towards the east to gain a more substantial impression of the principal short front immediately brings the spectator within the scope of the second zone, and it is clear from the plan that all points from which the principal front can be clearly perceived (without entering the last zone) lie in zone two The nature of the experience possible from this zone is defined by two components, the long and short sides of the temple At the north end of the zone the long side is the dominant dimension, at the south, long, and short sides of the temple have for the spectator virtually equal value.

The transition from zone two to zone three is marked by a bold flight of steps, and it is at this point of change that the critical modelling of the temple takes place, for not only does the path past the north-east angle of the temple induce a maximum value for the volume of the building, but the considerable change in level results in a vigorous modification of the vertical angle of perception, with accompanying change in the relative appearance of the temple elements

Zone three allows at the limits of its extent only an extremely small view of the long sides, points within the greater part of its area permit views of the east front alone Thus the smallest and last zone is deliberately restrictive and preparatory in function.

The kind of visual experience within any *one* of these zones bears a positive relationship to the form of the temple *Zone one* is specifically concerned (no matter where within its bounds the spectator takes up his position) with the main, long aspect of the

building, its characteristic appearance in this respect is always defined from this initial area To increase the range of these apparent characteristics necessitates movement into another zone, and the line of demarcation between these two zones is subtly but positively suggested by the long and shallow flight of steps *Zone two* is transitional, not only in position but in the kind of view it offers of the temple The whole range of vision possible within this zone provides an angle or essentially three-dimensional impression of the temple *Zone three* affords a type of view that is complementary to that given by zone one Zone one provided a generalized conception of the temple, zone three is the basis for a particularized and concluding picture

This demarcation of zones by means of defined areas and selected lines of change in level constitutes a notable extension to the type of arrangement that we have examined in the preceding examples. At Selinus the spectator was not provided with a defined starting point, nor was his position at any given stage in his path readily measurable in relation to the whole enclosure Similarly, at Aegina, although a propylaea was included, the straight-line path to the altar offered a rapidly graded experience which started at a maximum angle value and attained the final position in what was virtually a *common* zone

At Sunium all positions assumed by the spectator bear a measurable relationship to the zone in which they occur, and *each zone has directional and geometric properties* which maintain the organic nature of the whole complex These properties also induce in the spectator a full realization of the co-existence of the zones whatever his position may be within the temenos Movement is thus provided with a series of co-ordinates, and spatial experience within the bounds of the scheme is given a palpable framework

The foregoing analysis shows a unity and balance in the component parts of the temenos that contribute a most significant background to the directional movement of the spectator towards the temple The sustained geometric framework which is the essence of the Sunium arrangement differs from the setting at Delphi, where the steady change of level and the winding pathway heavily underlined the approach to the temple At Delphi the dominating frame of mountains and the steep slope of the site led to the bold solution of directly opposing the

temple to its setting, only the jutting platform of its base resists the downward slope of the ground and its attendant instability At Sunium a rigidly induced stability of the immediate surroundings lends a local resonance to the forms of the temple The plane of the sea beyond, only distantly accentuated by islands, offers the conditions for a detached and precise demonstration of the harmonies of arranged volumes

(*f*) *The Temple of Asclepios at Epidaurus* The Asclepian Sanctuary offers an arrangement whose components stand with notable freedom within their enclosure In comparison with the previous examples there is a lack of obvious climax in the placing of the principal structure, and the apparent equality in distribution and emphasis of the elements contrasts strongly with those schemes in which dominance of position or rigidly defined approach implies a focal point

The 'L'-shaped temenos is approached from the south, and within its area stand

- (*i*) The small temple of Artemis
- (*ii*) The Temple of Asclepios
- (*iii*) The Altar
- (*iv*) The 'Tholos'
- (*v*) The Stoa

Analysis discloses a constant measurement between the adjacent buildings in this list Thus a circle with its centre in the Temple of Artemis cuts through the Propylaea, the Temple of Asclepios, and the Altar Similarly a circle centred in the Temple of Asclepios passes through the centre of the Tholos and the centre of the Altar In view of the lack of alignment between these buildings, this strong positional identification within the temenos suggests a form of co-ordination that has its basis in a space continuum of advanced type The 'order of co-existing elements' is such that each building is profoundly significant as a *volume*, and any position taken by a spectator within the scheme tends towards three-dimensional conception of all these volumes

This articulation of elements results in a rich interplay of separate entities whose visual possibilities can only be suggested by assuming the spectator to take every available position in the temenos.

Let us determine how movement along the principal line of approach from the propylaea to the temple will affect the relationship between all the elements from the spectator's point of view Immediately inside the temenos he can see the south wall of the Temple of Artemis, and beyond the south-west angle of this building the whole of the south side of the Temple of Asclepios is visible Slightly further away and to the west the Tholos with its non-directional cylindrical form is seen across the angle of the peribolos Movement towards the Artemis building gradually eliminates the Temple of Asclepios from view, while the Tholos remains constant in its aspect On entering the restricted area defined by the peribolos angle and the west wall of the Temple of Artemis, the full form of the Temple of Asclepios appears for the first time This area has the effect of a second propylaea, though there is no screen to the west to provide a true restriction to vision such as has been defined for the propylaea in our discussion on the Aphaia temple.

That this is a critical point in the progress of the spectator is indicated by the conditions found here Considering what is visible in a clockwise direction we note

(*i*) The Tholos, subtending an angle of 18 deg

(*ii*) Portion of the Stoa, extending east from its extreme west side which is visible beyond the Tholos (21 deg)

(*iii*) The Temple of Asclepios (31 deg)

(*iv*) The space between the temple and the altar (35 deg.)

In connexion with (*ii*) it is clear that this standpoint offers the fullest experience of the stoa from the main line of approach, and the fact that one of the limits of its form is also visible from the 'secondary propylaea' serves to identify it with the 'completeness' of the other elements The Tholos tends to be a neutral or pivotal element in that its own appearance is constant, and from the 'critical' point onwards towards the temple and altar it is seen only against natural surroundings

Further progress along the path is accompanied by a cumulative modelling of the temple such as we have discussed in the previous analyses The great distance of the altar from the east front of the temple is notable, as well as the fact that its

centre lies opposite the north-east angle of the temple, this considerable lack of alignment means that the Tholos is not visible from any point within the greater part of the area defined by the temple front and the altar.

Approach to the Tholos is accompanied by a change in the appearance of the Temple of Asclepios which now shows only its south side When the Tholos ramp is reached, however, the west front appears, and west and south elevations are seen against the stoa Approach to the front of the Temple of Artemis from the propylaea is of a similar order to that shown for the Temple of Aphaia at Aegina, the distance traversed, however, is considerably greater

Such lines of approach indicate only a small number of the many positions in which these separate units can be seen in combination with one another, but sufficient has been suggested to show the manner in which their articulation enables clear perception to be made by the spectator of their individual forms, while an essential relationship is maintained This is made possible by virtue of an arrangement which demands as a general condition the visibility of all elements from any standpoint within the temenos

GENERAL NOTE TO SECTION V (4)

An essential contribution to the continuity within the temenos (enunciated above) is the grading of space which the characteristic peristylar arrangement of the temple affords So far, in our examination of the temple in its surroundings, we have attributed to it a bulk volume, that is to say, we have assumed it to present a simple prismatic form without the space modulation that the peristyle contributes

It has been considered desirable not to load the discussion with references to all the aspects of space definition that occur when a temple is placed within constructed surroundings The question, therefore, of transitional volume, as we may term the special relationship produced by the peristyle, will be examined in the concluding section

VI

THE GREEK ACHIEVEMENT

I A GENERAL THEORY OF RELATED VOLUMES

We have seen in Section I that the characteristic elements of space-structure on an architectural scale (that is, in scale with the perceptive and material needs of man) may be assumed to comprise

(*a*) the terrace, (*b*) the wall or column, and (*c*) the lintel or slab

Suggested enclosure or partial visual restriction on the basis of a constructed plane surface may be said to satisfy the general condition of architecture, but some form of practical enclosure (protective insulation from rain, cold, etc) is usually postulated as a necessary extension to the visual function of architecture

Although, in a sense, this function moves the architecture that embodies it into a special class, this class is such a predominant one in the general body of architecture that we shall at this stage carry our discussion in Section I somewhat further so as to examine the implications of relating practical and non-practical modes of enclosure The term *practical* will be used to signify the idea of protection from the elements, while *visual* or *non-practical*, as must be evident, will refer to those aspects of architectural creation that are concerned with the perceptive equipment of man

(*a*) *Direct Transition* The creation of a closed or practical volume implies a relationship between that volume and the general space external to it and embracing it A single opening can provide access from the 'outer' volume to the inner, and the enveloping surface of the latter defines the transition between the two Transition in the case of a simple cell is abrupt and without gradation, the spectator who moves from one volume to the other does so without preparation or adjustment The

only transition (and that is momentary) is afforded by the thickness of the envelope (wall or screen) Thus movement from natural surroundings into a simple cell involves (i) a change in sensation or visual experience, and (ii) a change in scale The former requires no further elaboration in view of the earlier discussion on controlled visual experience, the latter is a function of the former and arises directly out of the condition of constructed volumes on the human scale

The two components of the above relationship may be briefly described as possessing respectively complete freedom and complete restriction, and the visual necessity for grading the one component into the other, for adjusting the transition in a manner that will be apprehended by the spectator, demands an intermediate form of enclosure that will modify one component or partake of both.

(*b*) *Simple Gradation* Let us assume a simple rectangular building constructed on a plane surface, and having a single doorway Systems of gradation that would modify the natural or outer space in preparation for entry into the enclosed volume could, for example, take the following forms

(*i*) Low flanking walls at the entrance running some distance out from the building These would provide lateral definition, and although offering no restriction to upward vision they would *modify* the outer space and give a directional emphasis to the approach

(*ii*) A horizontally projecting slab above the entrance opening (either integrally constructed or independently supported) This would offer vertical restriction and consequent reduction in scale, although laterally there would be no visual restriction

(*c*) *Complex Gradation* Various combinations of (*a*) and (*b*) arranged either jointly or in succession can be postulated to meet the special demands of purpose, scale, or topography We have seen in Section I the wall employed as a grading element in the house at Tel-el-Amarna, and reference to the illustration will show the degree to which these principles apply

A specific example will serve to illustrate the idea of complex gradation The Egyptian temples (particularly those of

canonical arrangement such as that at Edfu) offer an excellent demonstration of the deliberate and architectonic adjustment of visual range from 'outer' to 'inner' space

The Temple at Edfu may be analyzed briefly as follows

(*i*) Position and direction with reference to general situation are primarily defined by an avenue of sphinxes which implies a selected path towards the entrance These units of definition, while not forming continuous lateral planes of definition such as would be provided by walls ((*b*) (*i*) above), offer a preparatory degree of enclosure to the spectator, as well as an extension to the actual forms of the main structure

(*ii*) The next stage of penetration into the building is provided by a peristylar forecourt, open to the sky but laterally restricted. Here is a positive diminution in scale compared with that suggested by the 'point' accents of the sphinxes The forecourt itself has a secondary gradation of volume by virtue of the colonnade which lies on three sides, a refinement that heightens the reciprocity between this element and the next in the graded approach

(*iii*) A columned portico, roofed but partially open to the forecourt by means of openings above a screen wall that is situated between the outer columns, marks the next stage The relationship in this instance is of the type that partakes of both volumes, for direct lateral penetration of one volume into the other enables the existence of a strong liason between the *unroofed* court and the *roofed* portico

(*iv*) The next volume is a practical one, roofed and protected from the elements, and marking a notable decrease in size from the portico, which in turn is considerably less in area than the forecourt

(*v*) Finally the innermost sanctuary is reached, dark, narrow, and low, completely insulated from the outside world, and only approachable through a succession of ever greater restricting volumes a cell which, within the limits imposed by human size, reflects a complete antithesis to the light and free space of the outer world

In the light of the general categories of volume relationship enunciated above we may now proceed to a consideration of the Greek achievement in this sphere

2 THE ABSOLUTE FACTOR IN GREEK VOLUME ARRANGEMENT

In terms of the basic propositions on space definition enunciated in Section I together with the general theory of grading volumes set out above we may now attempt a statement on the central theme of Greek temple arrangement Our analyses of specific groups, especially those where outside influence was not so marked as to offer practical difficulties in the course of construction, have provided wide terms of reference within which to seek the criteria of an underlying doctrine

At Aegina, Sunium, and Epidaurus in particular, externally imposed conditions are at a minimum, and a 'pure' solution approaching a high degree of abstraction is the outcome of these favourable conditions The sanctuaries at Delphi and Athens were subject to a greater extent to the special influences arising, in the former example, from the acute irregularity of the surface on which the group was arranged, and in the latter from similar natural factors coupled with the pressure of political, financial, and religious restrictions. The scheme at Selinus illustrates the probable effect on a temenos of an adjusted town plan, and does not reflect a complete solution in the sense of a project that has been imposed on a site as a fully predetermined arrangement.

Prime factors that have emerged from our analyses are the extreme flexibility and inherent generalization of element distribution that characterize the sanctuary groups These factors allow simultaneously an infinitely wide range of plastic experience, and a root similarity or recognizable framework in the contributory elements Thus the *kind* of experience that is undergone by a spectator is fundamentally the same in each sanctuary, and although wide variations occur in the distances between elements, in the directional system employed from propylaea to climax, and in the number, size, and disposition of elements, that experience is the outcome of the application of a central thesis to the material expression of intangible demands

So far we have examined the temenos as a complete and constructed system which is in process of being 'explored' by a moving spectator who is thus assumed to represent a characteristic participant in an actual ceremony taking place within its

boundaries The *movement* and *direction* aspects are, in this form of analysis, predominant terms in the space system that arises from the combination of fixed and variable factors Visual experience is a function (in the mathematical sense) of this combination and consequently cannot be assessed as an *absolute* value

By assuming points of observation along a line of approach between the propylaea and a final position adjacent to altar and temple, and measuring the horizontal and vertical angles subtended by the visible portion of the temple at each of these points, it would be possible to plot on a graph the range of visual experience offered to a spectator by the form of the temple Such an expression would require the suitable integration of this experience, in terms of vertical and horizontal angles, measured on one co-ordinate against the distance traversed, on another co-ordinate Thus a comparison of the degrees of effect offered could be established by plotting the curves on a common diagram Such an undertaking, however, will form more properly the subject of a separate inquiry, and will not be included in the present thesis

Our immediate task is to investigate the relationship subsisting between the elements of the temenos considered as an abstract arrangement, that is, without reference to a perceiving spectator within the system

The horizontal plane or terrace which 'contains all the elements of the group is the basis on which the system is generated, and which affords formal dimensions and unity

(At Aegina and Epidaurus a single terrace carries the separate superstructures, at Sunium a series of parallel planes is contained within the peribolos, but these planes may in turn be regarded as having a common basis)

The peribolos or enclosing wall contributes vertical definition to the terrace, and separation in the sense of formal demarcation between natural and constructed surroundings. Its chief spatial function is thus the maintenance of material unity in the system

The outcome of terrace and peribolos in combination is an implied volume in which are situated the separate component volumes of propylaea, temple, statues, etc Terrace and wall do not provide practical enclosure, but as we have seen in Section I

their *measuring* and *defining* attributes are such as to formalize space

The practical volumes consist of propylaea, temple, and treasury (and in the case of Delphi and Epidaurus, stoa) and the relationship between these can be regarded through the medium of the generating plane, that is distance and height, or distance alone on a single plane system, or more completely, in terms of volume relationship

Altars and free-standing statues constitute 'solid volumes' and these may be regarded as positive interruptions in the continuity of the visually penetrable space that encloses them

The final resolution of these elements in a self-contained system is primarily dependent upon the maintenance of some form of spatial continuity within the system, and this factor may now be discussed with reference to the propositions previously enunciated on simple and complex graded space If we consider the 'hollow' elements within the scheme (temple, treasury and propylaea) in relation to their immediate surroundings we shall see that the relationship is a graded one, the transitional volume defined by the peristyle of the temple partaking both of the *apparent* volume of the structure and of the outer volume which encloses it Thus, there is a mutual penetration of space which operates about the plane defined or suggested by the peristyle itself We can assume *apparent* volume of the structure to mean the space enclosed by an envelope defined by the *limits* of its forms Since, however, the nature of the peristyle is such as to allow penetration of the enclosing space as far as the walls of the cella, it is clear that a measurable volume can be said to pertain both to the structure itself and to the space which encloses it

This shared volume in the case of the normal peripteral temple completely embraces the structure and is productive of an inter-relationship of a highly unifying order Direct transition between a simple walled volume and its enclosing space cannot achieve this type of *rapprochement* as the exclusiveness of continuously defined volume must always result in isolation rather than in a mutually induced unity Thus the temple which stands within the peribolos has a clearly assessable general identity by virtue of its free-standing apparent volume, and has a simultaneous 'overlapping' value induced by the two stages of

its definition. Thus its spatial individuality is enabled to coexist with its state as a participant element in a specific space system.

The condition of the propylaea is similar, but its special function and position as a transitional as well as practical volume bring about corresponding variations in its form. The propylaea, unlike the temple, is situated against the peribolos, and although its hollow form is in direct contact with both the outer space beyond the temenos and the implied inner space of the temenos, the structure itself preserves the character of the enclosing wall by its own lateral walls. The characteristic 'columns in antis' arrangement of the opening towards the temenos echoes the peristyle treatment of the temple, while the restricted form of the propylaea (*i.e.* enclosed by flanking walls) directs the penetration towards the focal point of the temenos.

Once again the individual structure is clearly expressed, and unity between the individual structure and the whole system coexists.

Both elements (temple and propylaea) are thus identified with the space of the temenos, and through the medium of this common factor become related to one another. In terms of these constituents a formal arrangement has been created which approaches closely the perfection of an abstract theorem.

It will be seen from this discussion that the essential character of the Greek temenos is not derived basically from *size* or *number* so much as from the *type* and special combinations of its structural forms. Scale in relation to human size is necessarily a completing term in the system, but the purely quantitative aspect of construction, once this demand has been satisfied, always remains of secondary importance in Greek architecture. Again, when the components subscribe to a system of spatially related yet freely articulated entities within that system, the actual position or number of such elements, though materially influencing the resultant plastic effect, does not modify the intrinsic character that permeates the whole system.

The standardization of the peripteral temple type is significant in this respect since the variable elements that occur in its structure are never such as to diminish the *interrelation* function which the general type satisfies. Variations in number and in detailed proportions in the components and in bulk size are reflected during the period of Doric temple building, but no

organic departure from the central type is shown It is apparent that the greater unity which the temenos group represented could not permit an unlicensed virtuosity in temple construction which would tend to disrupt the general framework Exposition of Greek architecture has too often tended to regard the temple as an isolated structure, aesthetically measurable in terms of its own form Such an estimate is quite alien to the evidence of the temple group, and grants the temple only the significance of a traditionally repeated form with a low index of vitality

Mere change in shape or in the disposition of the parts of a single architectural entity cannot offer more than an extremely limited range of plastic expression, and continued and arbitrary variation is more likely to result in loss of identity and amorphousness than in renewed strength Even more serious from the point of view of universal significance, the organic modification of recognizable visual or space-defining standard elements will lead to visual confusion, since the measuring and repeating function of the elements of a formal system of building is the basis on which classical architecture is constructed

Two contributory factors of prime importance in Greek volume arrangement in the temple sanctuary may now be discussed

(*a*) *The articulation of the constituent elements*

(*b*) *The range of formal combination of these elements*

(*a*) The term articulation implies continuity or system, and the practical methods by which this condition was obtained in the temenos have been suggested earlier in this section The geometric aspects of an articulated system, however, require some elucidation

Formality in architecture is commonly assumed to be derived from axial and symmetrical arrangements of elements, but it was induced in the temenos scheme by a wider interpretation of the term than a simple linear system (with its two-dimensional basis) was capable of providing. The discussion on the sanctuary at Sunium (Section V, (*e*)) though undertaken with a view to estimating the experience of a spectator within the system, may be recalled at this stage insofar as it postulated an absolute relationship between the components It will be remembered

that irrespective of movement each wall, building, terrace, an flight of steps appeared to bear an organic relationship to t whole, and that the situation and balance of each element we such as to suggest the 'interlocking' of the parts of a mechanism If we substitute for the words wall, building, terrace, etc , t abstract terms plane, volume, and surface, the organic suf ciency of the scheme may be generalized by stating that t interrelated components are not only of 'regular' shape, b regarded as constituents of a Euclidean space complex th maintain an undeformed identity, as well as fulfilling a co tributory role in the complete framework

The dimensions of these components (whether significant surfaces or volumes) can be directly computed, and the re tangular basis of the system renders it stable and finite

(*b*) The flexibility of a space system of three or more componer is governed only by the demands of formal relationship, and such as to allow an infinite number of schemes that will mai tain the characteristics of these 'standard' and recognizab elements This flexibility enabled the Greek architect to expl sites of widely differing scope, and neither variations in situati and size nor surface peculiarities were able to destroy t central theme of the temenos arrangement

In the course of our enquiry we have examined the enclosu at Delphi, Sunium, and Epidaurus, each being regarded fro the spectator's point of view In the present section a gener statement has been attempted to assess the significance of t temenos as an abstract arrangement We may conclude th part of the discussion by a brief summary of the achieveme of these examples in terms of *spectator* reaction and *absol* value

DELPHI At Delphi the arrangement is especially notable f the vigour and range of plastic experience offered the spectat and on the scale of spectator-reaction this sanctuary accentuat perhaps more than any other group, the temple as a key eleme and visual climax The space occupied by the approach does n conform to a geometric pattern of the regular or undeform type, but the treatment of the enclosure is such as to underli

heavily the movement and direction factors The arrangement at Delphi reflects too closely the infusion of topographical characteristics into the system to achieve a high degree of abstraction The unity of the scheme, however, has been maintained in terms of the basic principles of temenos arrangement

SUNIUM The sanctuary at Sunium represents, perhaps, the highest achievement of the Greek architect in striking a just balance between the attributes of regulated movement in the spectator, and the purity of abstract geometric arrangement In this example the intrinsic repose of an absolute construction is not distorted to meet the 'force' imposed by a participant within the scheme, but the combination of practical and abstract values is here shown to be feasible on a scale compatible with human experience

EPIDAURUS In this example visual experience is not directed so rigidly as in the two preceding arrangements, nor is the 'geometry' so expressly delineated as that of Sunium, but the abstract factor is subtly fused in the whole The principal components achieve a full spatial relationship through the medium of their peristyle penetration, and the free disposition of Temple and Tholos allows a full realization of their volumes within the peribolos The beauty and grace of the Asclepian temple suggest a more humanistic atmosphere than that reflected by the Sunium group, when we recall the offsetting informality of the adjacent grove In the group at Epidaurus there must have been a fine harmony of form and space i lyrical freedom in the broad disposition of disciplined units

3 THE GREEK MODE IN SPACE CONSTRUCTION

Our survey has revealed the nature of the elements that make up the characteristic architectural arrangement of the Greek epoch, as well as indicating the many detailed constituents which in turn add special significance to those elements The limitations of structural method and available material, the influence of natural conditions and economic trends, the demands of human habit and human scale – all these factors

played a defining part in the search for architectural standards, and for the solution of problems generated by the civic consciousness of the people Each of these contributory forces is reflected in the final structure of the temple, house, or city, but the thesis which alone gives plastic unity to all these undertakings, the common factor whose essence is not susceptible of material modification or practical variation, is the system of space structure which underlies every manifestation of formal architecture in Greece

The range displayed in Greek architecture between 600 and 200 B C reflects a complexity of forms and arrangements which is not a product of confused purpose or arbitrary method. The variation in type and size and organization that we see in Greek work is rather the rich pattern of application of a generalized space system to the specific requirements of a civic structure. The fusion of absolute or abstract values with local and human is a process that must ultimately furnish us with a series of joint values in respect of the separate manifestations that we have examined

Abstract plastic arrangement unrelated to human participation, whatever other significance it may attain, must yet remain beyond the sphere of practical architecture On the other hand the mere conjunction of protective elements without system cannot approach the condition of pure architecture, even though the human scale is recognized In Greek architecture the absolute is not sacrificed to practical expediency, nor does it dehumanize the local attributes of appropriate scale or repudiate functional efficiency The simultaneous satisfaction of an abstract condition together with a local material demand implies a flexibility of solution between wide limits The process has as constants the established elements of space measure, and as variables the requirements of special purpose

If we turn once again to the temple groups it will be apparent that in general the abstract value is maintained at a high pitch through selective standardization and a broadly valid system of defining elements The repetition of such units maintains the identity of the separate components, while the spatial interlocking of these components assures an overall stability and unity in the system

So, too, is unity in the domestic dwelling attained, and so too

does its unity partake of the greater system that we term a city The house with its peristyle, the city with its agora, the temple with its interpenetrating pattern of colonnades in the temenos – each subscribes to the dominant space ideal that embraces them The fusion of ***absolute*** with ***local*** takes place in such a manner that the house is yet habitable and monumental at the same time, there is no devaluation in the system in spite of the fact that the scale of the house is directly attuned to the needs of private life Again, so justly balanced is this fusion that the agora in satisfying the expanded function of the civic meeting place approaches a high absolute value without destroying the common touch' Finally, the temenos with its temple, though it moves still further towards the purely abstract (having a low index of practical function), also shares the common visual measure that ennobles the house and humanizes the civic building

No direct summation can capture this subtle grading of the abstract as a constituent of the architecture of Greece Although the elements are measurable, and their effect computable, the balance between absolute and local is so delicate and so carefully attuned to function that one must not be tempted to frame a categorical equation in explanation of the phenomenon To do so would be to reduce to rigid terms something whose essence lies in the infinite variety that springs from the classical notation We must recognize rather, the formalization of visual experience that such a system engenders, and with this abstract term as an evaluator equally applicable to each manifestation, allow the wide lyricism and immediacy that characterized Greek architecture

The visual unity which the Greek system offered is a factor which the uncontrolled development of our own cities has ill-fitted us to appreciate Unfinished, amorphous, are terms that can be appropriately applied to the general condition of the towns that rose from the decay of Greece and Rome, and only in rare instances do we find some reflection of the order and measure that was the true heritage of Greek architecture

Architecture in the Greek scheme of life is symbolic of the wider framework about which a manifold code of perception was constructed For as Jaeger[1] says

[1] JAEGER Pages xx and xxi

"The literary forms used by the Greeks, with all their manifold variety and elaborate structure, grew organically out of the transference of the bare simple forms in which men express themselves in language, to the ideal sphere of art and style In the art of oratory, too, their ability to carry out a complex plan and create an organic whole out of many parts proceeded purely and simply from a natural perception, increasingly sharpened, of the laws which govern feeling, thought, and speech – the perception which finally (grown abstract and technical) created logic, grammar, and rhetoric "

And again,

"In philosophy the force which produced the forms of Greek art and thought is most visibly displayed It is the clear perception of the permanent rules which underlie all events and changes in nature and in human life Every people has produced a code of laws, but the Greeks always sought for one Law pervading everything, and tried to make their life and thought harmonize with it The *theoria* of Greek philosophy was deeply and inherently connected with Greek art and Greek poetry, for it embodied not only rational thought, the element which we think of first, but also (as the name implies) vision, which apprehends every object as a whole, which sees the *idea* in everything – namely, the visible pattern "

Today one can still see 'the organic point of view' in the ruins of Greece, for even these vulnerable and perishable projections of the Greek mind retain sufficient of their identity to enchant the eye and refresh the mind with their deathless inspiration Amedee Ozenfant, with the trained perception of the abstract painter, has given us a sympathetic record[2] of the extent to which we can experience the ethos of the material surroundings of the Greeks On revisiting Delphi he focuses his attention on the Athenian Treasury

"I looked at the harmonious building from every side - far off, close up, closer still I climbed the side of the hill to see it from another point of view Everything was changed, yet everything remained beautiful, right Everything worked together

* * *

As far as the eye could see everything was coherent, unanimous, and necessary, existing in a sort of total symbiosis

[2] OZENFANT Pages 394–6

But I was not a passive spectator By my movements, which altered the relationships of the building and of the near and distant objects, I was endowing the view with movement And all the while there sang a mighty chorus of shapes, each indispensable to each – those contrived by the architect, and those that were formed by the lovely place itself When I stooped down, the architrave was knit closely to the vigorous angle of the walls When I stood up, everything rose with me, and the whole of great Delphi accompanied my movement Design followed design, and from each there arose chants, heroic cries, hymns of praise, soaring melodies When I stopped, they fell again into serenity, which is a state of expectation, not an end

* * *

Everywhere in Greece nature takes an interest, a share in the works of men, and men take her into account Nature commands, but so does man Everything in Greece commands – literally each thing From the smallest to the greatest, every element is distinct, and appears proud of itself, aware of its necessity to the whole "

PLATES



Plate 1 The Pyramids at Abusir
Borchardt *Grabdenkmal des Konigs Ne-user-ra*



Plate 2 Household earthenware vase from Phaestos, dating from the Middle Minoan Period
Photo Lambrides



Plate 3 Model of part of the City of Priene, showing Agora, Temples, Gymnasia and Stadium, Theatre, and typical Houses

In the Pergamon-Museum Berlin
Schede *Die Ruinen von Priene*

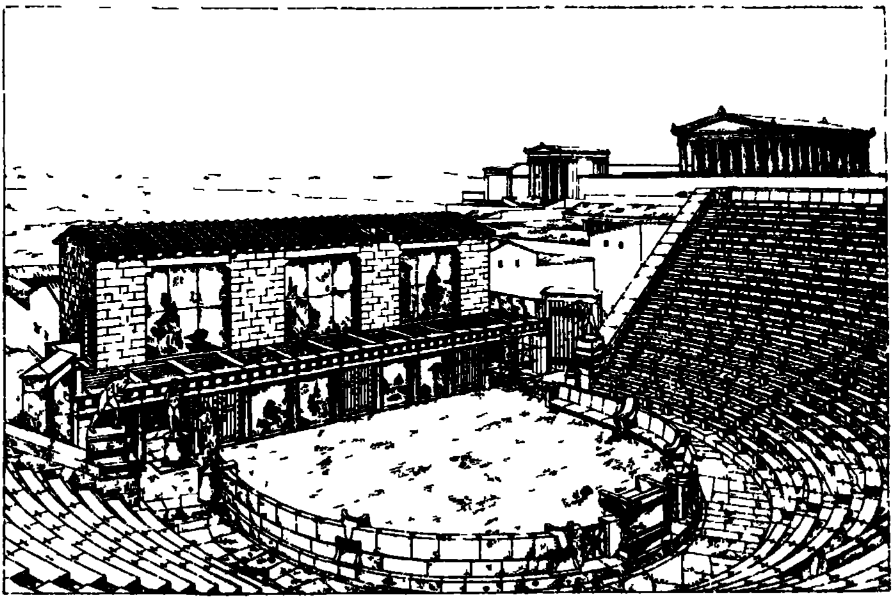


Plate 4 The Theatre at Priene, after von Gerkan's reconstruction
Schede *Die Ruinen von Priene*

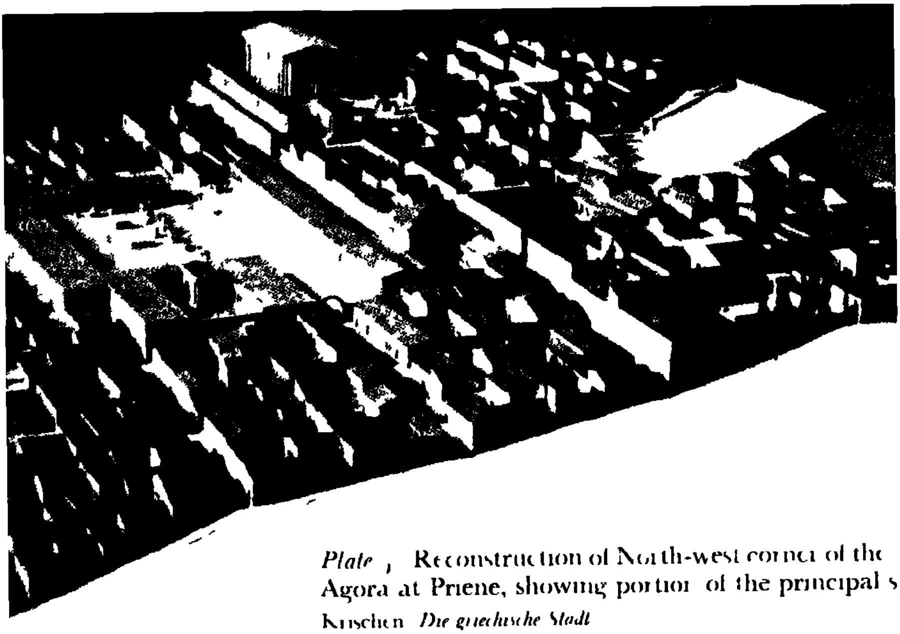


Plate , Reconstruction of North-west corner of the Agora at Priene, showing portion of the principal s
Krischen *Die griechische Stadt*

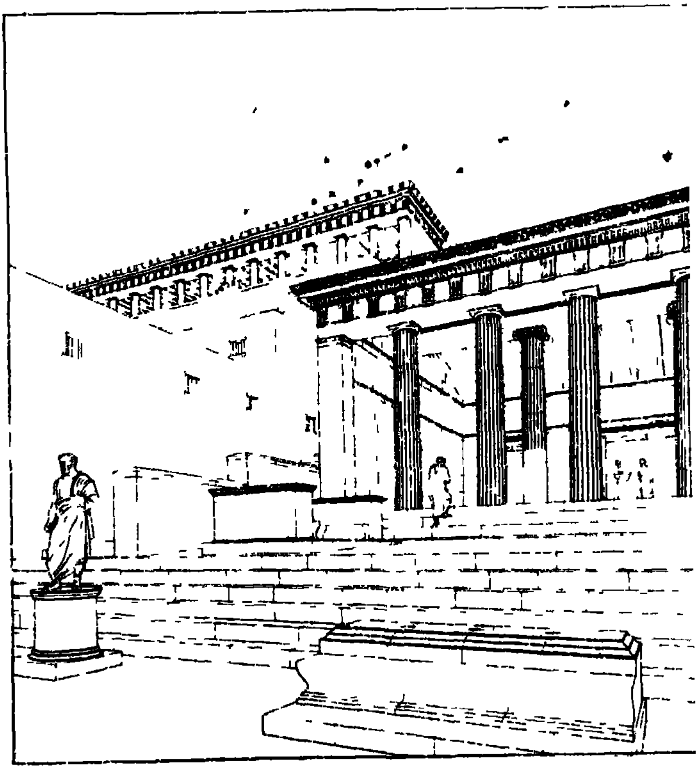


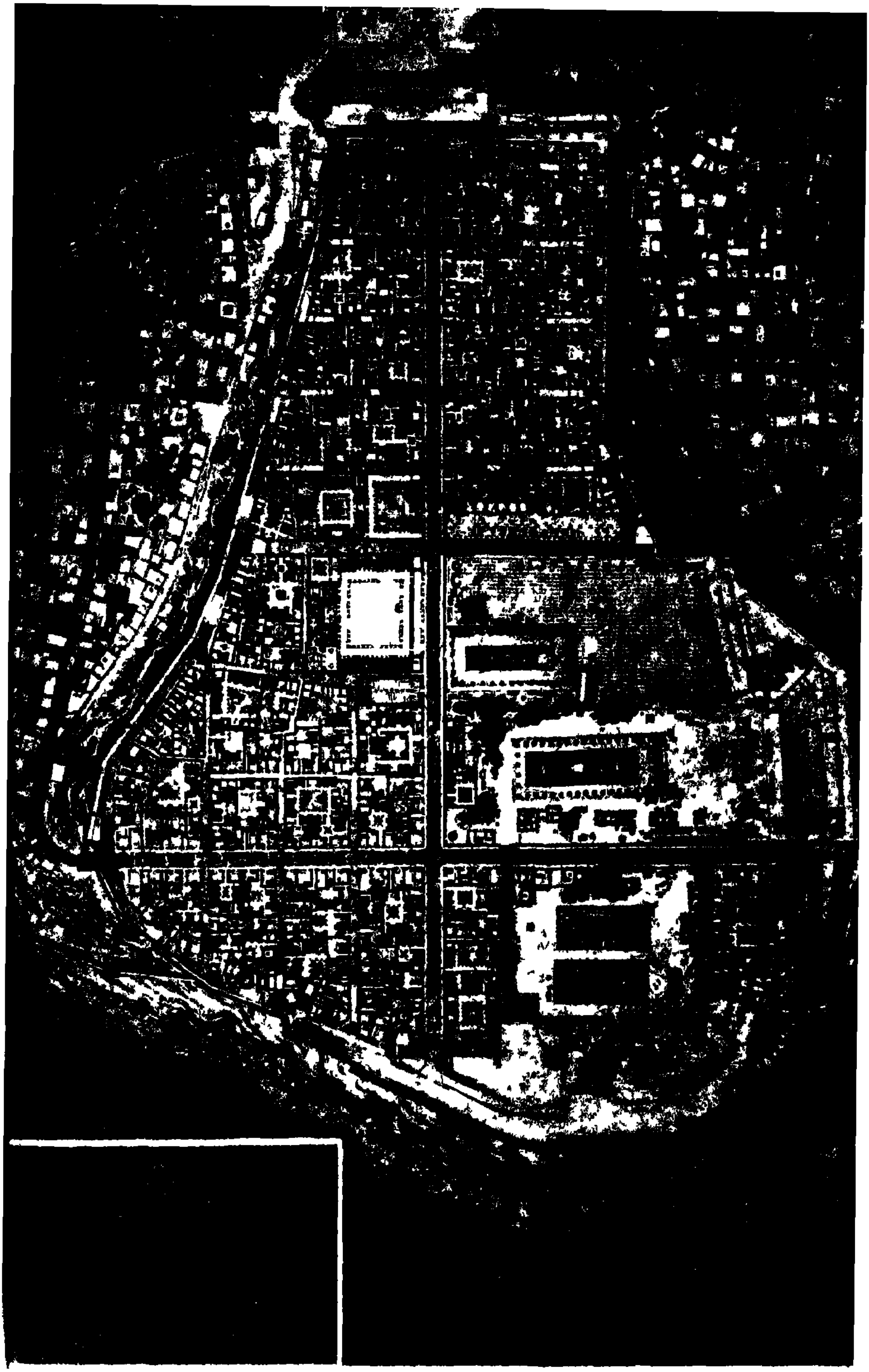


Plate 6 Portion of the Stoa at Cnidus in Ionia, third century B.C.
Stratton *The Orders of Architecture*



Plate 7 Reconstruction of Selinus by Jean Hulot
D'Espouy *Monuments Antiques*

Plate 8 Reconstructed plan of Selinus by Jean Hulot
D'Espouy *Monuments Antiques*



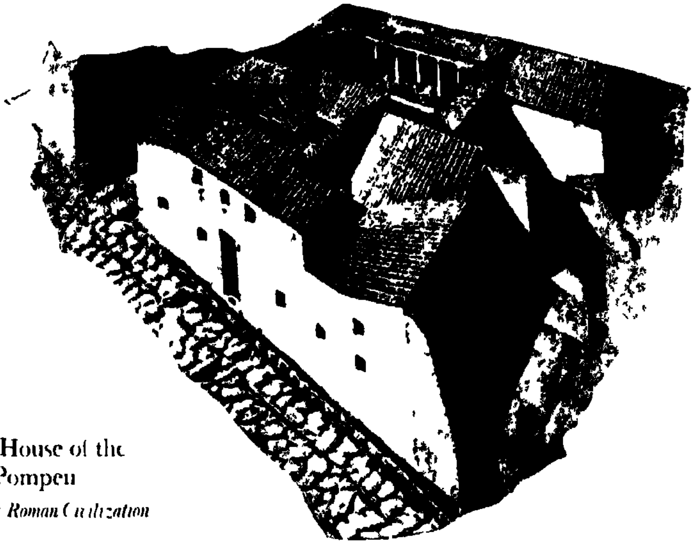


Plate 9 House of the Vettii, Pompeii
Giles *The Roman Civilization*



Plate 10 Peristyle, House of the Trident, Delos
Riehl *Griechische Baukunst*



Plate 11
Wall painting at Pompeii
Beazley and Ashmole
Greek sculpture and painting



Plate 12 Mosaic, House of the Trident, Delos
Chamonard *Le quartier du theatre*

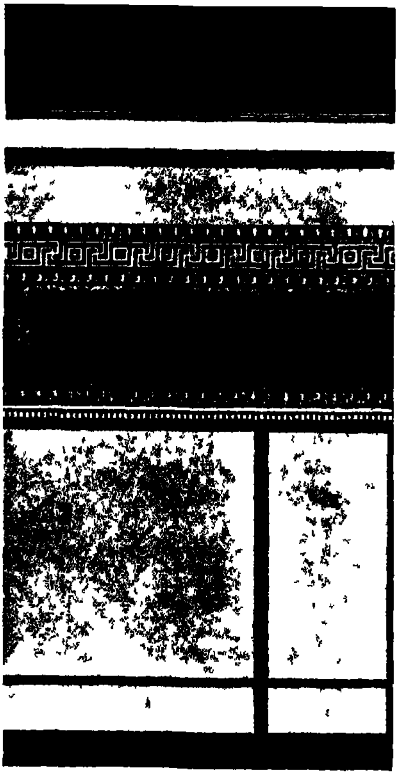


Plate 13 Interior wall treatment, House of the Trident, Delos

Chamonard *Le quartier du théâtre*



Plate 14 Remains of wall stucco, Temple 'B' at Selinus



Plate 15 Reconstruction of Temple 'C' at Selinus by Jean Hulot
D'Espouy *Monuments Antiques*



Plate 16 Remains of Temple 'C' at Selinus



Plate 17 East front of the Temple of Concord at Acragas

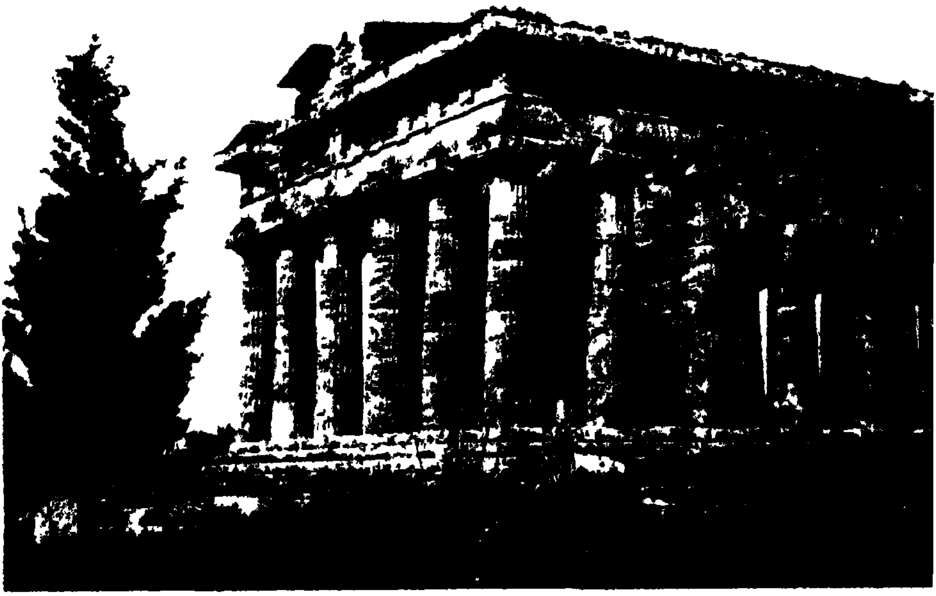


Plate 18 The Doric Temple of Poseidon at Paestum

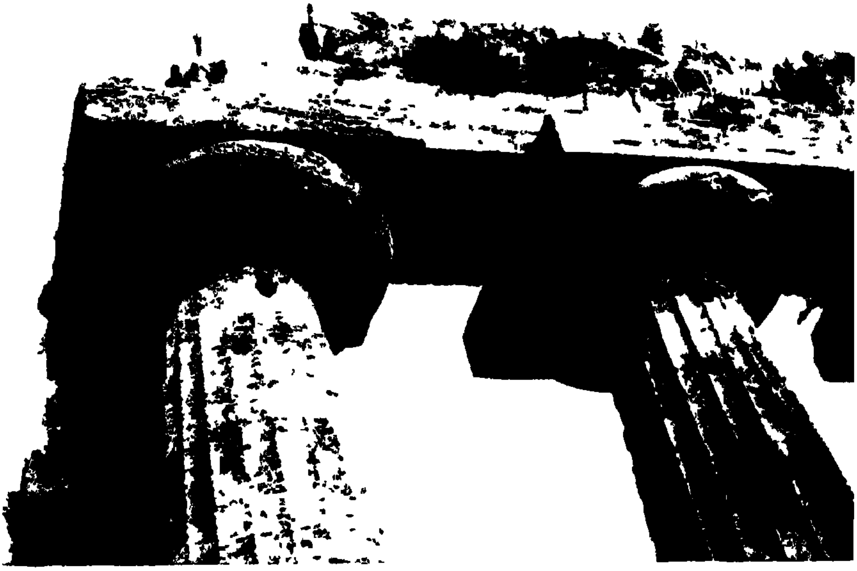


Plate 19 Capitals of the Basilica at Paestum



Plate 20 Portion of substructure, east front Temple of Zeus, Olympia, showing nature of 'shell conglomerate'



Plate 21 Metope of the Cattle-Raiders from the Sicyonian Treasury, Delphi



Plate 22 Fragment of the south frieze of the Siphnian Treasury, Delphi

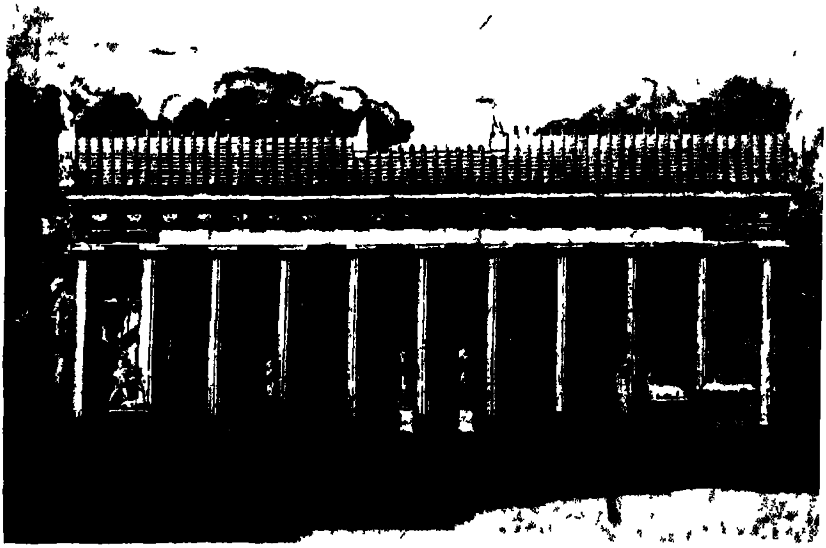


Plate 23 The Temple of Asclepios at Epidaurus
D Espouy *Monuments Antiques*



Plate 24

Two views on the Sacred Pathway at Delphi



Plate 25



Plate 26 Reconstruction of the Periclean Entrance Court to the Parthenon

Stevens *The Periclean Entrance Court of the Acropolis of Athens*

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